Round 7
Groundwater Monitoring Report
for
Defense Reutilization and Marketing Office

Naval Submarine Base New London
Groton, Connecticut

Northern Division
Naval Facilities Engineering Command
Contract Number N62472-90-D-1298
Contract Task Order 0267

April 2000

TETRA TECH NUS, INC.

040010/P

ROUND 7 GROUNDWATER MONITORING REPORT
FOR
DEFENSE REUTILIZATION AND MARKETING OFFICE

NAVAL SUBMARINE BASE - NEW LONDON
GROTON, CONNECTICUT

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Northern Division
Environmental Branch Code 18
Naval Facilities Engineering Command
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CONTRACT NUMBER N62472-90-D-1298
CONTRACT TASK ORDER 0267

APRIL 2000

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1.0 INTRODUCTION

This Round 7 Groundwater Monitoring Report for the Defense Reutilization and Marketing Office (DRMO) at the Naval Submarine Base New London (NSB-NLON) in Groton, Connecticut was prepared for the U.S. Department of the Navy (Navy) by Tetra Tech NUS, Inc. (TtNUS) under the Comprehensive Long-Term Environmental Action Navy (CLEAN), Contract Number N62472-90-D-1298, Contract Task Order (CTO) 0267.

This document has been prepared in accordance with the Navy Installation Restoration Laboratory Quality Assurance Guide (Interim Guidance) of the Naval Facilities Engineering Service Center, (NFESC, February 1996).

1.1 BACKGROUND INFORMATION

1.1.1 Base Description

NSB-NLON is located in southeastern Connecticut in the Towns of Ledyard and Groton. It encompasses approximately 576 acres and lies on the east bank of the Thames River, approximately 6 miles north of Long Island Sound. NSB-NLON is bounded to the east by Connecticut Route 12, to the south by Crystal Lake Road, and to the west by the Thames River. The northern border is a low, east-southeast trending ridge extending from the Thames River to Baldwin Hill.

NSB-NLON currently provides base command for naval submarine activities in the Atlantic Ocean. It also provides housing for Navy personnel and their families and supports submarine training facilities, military offices, medical facilities, and facilities for the submarine maintenance, repair, and overhaul.

1.1.2 Site Description and History

The DRMO is adjacent to the Thames River in the northwestern section of NSB-NLON. The DRMO is the storage and collection facility for items to be sold at auctions and sales held periodically throughout the year. Figure 1-1 shows the site location within NSB-NLON, and Figure 1-2 shows the general site plan.

The DRMO was used as a major base landfill and burning ground from 1950 to 1969. The materials burned and landfilled included construction materials, combustible scrap, and other non-salvageable waste items. These materials were burned on the Thames River shoreline adjacent to the current location of the DRMO. The residue was pushed to the shoreline and partially covered.

Atlantic Environmental Service, Inc. (Atlantic) personnel reviewed archived aerial photographs of the DRMO areas part of the Phase I Remedial Investigation (RI) (Atlantic, 1992). The 1934 photographs show fill in the southern portion of the site. Fill for bulkheads and docks south of the DRMO did not exist at that time. Aerial photographs from 1951 show the land in its present configuration, except for the northwest portion, which was not filled at that time.

Atlantic personnel inspected the site on September 30, 1988. Metal and wood products were stored throughout most of the site. Buildings 479 and 355 are located within the paved area to the south and are primarily used for storage. Building 491, located in the unpaved area to the north, is used for miscellaneous storage, including batteries. Metal baling operations were performed adjacent to Building 491 on a gravel surface. Based on an inspection of the building plans, Atlantic personnel identified the presence of a former battery acid handling facility at the north section of the site, within Building 491. A large scrap yard was located north of Building 479. Submarine batteries were stored in the southeast portion of the site adjacent to the railroad tracks; no leakage was observed.

Prior to 1995, the southern half of the DRMO was covered with asphalt, most of which had deteriorated, while the northern portion was unpaved and had a gravel surface. A Time-Critical Removal Action was performed at the DRMO by OHM Remediation Services Corporation. Construction aspects of the removal action were completed in January 1995. The removal action focused on the removal of soil contaminated with lead, polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs) from the northern half of the DRMO. The spent acid tank was also removed. The site was subsequently remediated and a composite cap was placed over a majority of the central and northern portions of the site (OHM, September 1995). The cap consisted of a woven geotextile liner, a geosynthetic clay liner (GCL), and a nonwoven geotextile liner. Bituminous concrete pavement was then placed over the entire area of the composite cap. The paved (southern) portion of the site was upgraded with an additional asphalt layer.

1.1.3 Previous Investigations

1.1.3.1 Phase I RI

The Phase I RI (Atlantic, 1992) at this site included test borings and monitoring well installation, as well as, soil, surface water, and groundwater sampling. Twelve shallow surface soil samples and 12 subsurface soil samples were collected from 7 test borings and 5 monitoring well borings. Four surface soil samples were collected and analyzed. Six groundwater samples were collected from five shallow wells and one deep well. Additionally, one surface water sample was collected from the Thames River at the northern end of this site (B&R Environmental, March 1997).

Concentrations of Volatile Organic Compounds (VOCs) in the soil were generally low. Semivolatile Organic Compounds (SVOCs) were present in most soil samples collected in the former landfill area. They were predominately comprised of PAHs, many of which were detected at elevated levels. A PCB, Aroclor 1260, was detected at almost all soil sample locations. Pesticides were detected in one soil sample at elevated concentrations.

Trichloroethene and 1,2-dichloroethene were detected in groundwater at three shallow downgradient wells. SVOCs (including PAHs), pesticides, petroleum hydrocarbons, or PCBs were not detected in any wells at the DRMO site. The inorganic groundwater analysis results indicated that selenium exceeded the primary drinking water standards for three wells. No VOCs, SVOCs, pesticides, or PCBs were detected in the upgradient surface water sample. Comparison of the inorganic results for this sample with the downgradient water sample (Goss Cove) did not suggest any detectable impact on the Thames River from the DRMO based on this limited data set .

1.1.3.2 Draft Focused Feasibility Study Field Investigation

A field investigation in support of the draft Focused Feasibility Study (FFS) was performed at the DRMO site in October 1993 to better define the extent of soil contamination. Twelve surface soil samples and twelve subsurface soil samples were collected. One surface and two subsurface field duplicates were also collected. One of the borings was completed as a monitoring well (6MW8S) (B&R Environmental, March 1997).

The highest concentrations of VOCs were present in soil samples west of Building 491. SVOCs, predominately PAHs, were detected in soil across the site. PCBs (Aroclor 1254, Aroclor 1260, and Aroclor 1242) were detected at nearly all boring locations at low to high concentrations. Pesticides (DDE, DDD, DDT) were detected at many locations across the site, primarily at low concentrations; however, several locations were found to have elevated levels. Concentrations of inorganic compounds were above background at all locations. Of primary concern at the site were the high levels of lead.

1.1.3.3 Phase II RI

Five new groundwater monitoring wells (two shallow and three deep) were installed and sampled during the Phase II RI. Additionally, 4 previously installed shallow wells were sampled. Two rounds of groundwater sampling were completed and ten samples were collected during each sampling round. Three subsurface soil samples were collected during the installation of three of the new wells (B&R Environmental, March 1997).

Relatively high concentrations of multiple organic and inorganic compounds were detected in the soil matrix at the DRMO. Organic chemicals detected at high concentrations include various halogenated aliphatic compounds, PAHs, phthalate esters, Aroclor-1254, and Aroclor-1260.

The results of the Phase II RI suggested that, in spite of the fact that relatively high concentrations of some VOCs were detected in the subsurface soil, it did not appear that substantial impact on the groundwater had occurred to date. In addition to the various organic chemicals detected in soil at the DRMO, relatively high concentrations of lead still remained in soil after the Time-Critical Removal Action was conducted during the course of the Phase II RI. Surface and subsurface soil concentrations of lead ranged as high as 4,980 mg/kg and 2,140 mg/kg, respectively. In spite of the high lead concentrations in soil, only limited evidence of lead migration to the water table is evidenced by the groundwater analytical results. Additionally, the results indicated that the cap effectively minimized precipitation infiltration to the groundwater (B&R Environmental, March 1997).

1.1.3.4 Time-Critical Removal Action

A Time-Critical Removal Action was performed at the DRMO by OHM Remediation Services Corporation during the course of the Phase II RI. Construction aspects of the removal action were completed in January 1995. The removal action focused on the removal of soil contaminated with lead, PAHs, and PCBs from the northern half of the DRMO.

First, a total of 73 soil samples and two pavement samples were collected from the scrap yard area north of Building 479. Then, soil was excavated to a depth of approximately 3 feet (or to the water table if the depth to water was less than 3 feet). Approximately 4,700 tons of soil was removed. Confirmation sampling was initiated when excavation operations were approximately 75% complete. Some further excavation was subsequently performed. Residual contamination above the PRGs remained in the soil after excavation was complete due to the excavation being limited to 3 feet by the shallow water table and exceedances of the allotted time for the project (B&R Environmental, March 1997).

After the completion of removal activities, the area was backfilled with clean borrow material. A cap consisting of a woven geotextile liner, a geosynthetic clay liner (GCL), and a nonwoven geotextile liner was installed. Approximately 12 inches of crushed stone and 3 inches of asphalt were placed over the clay/geotextile cover. The remaining (paved) portion of the DRMO was also upgraded via placement of an additional asphalt layer.

1.2 SCOPE AND OBJECTIVE

The objective of this Round 7 Groundwater Monitoring Report is to present and evaluate the results of the sixth round of long-term groundwater monitoring at the DRMO site. This monitoring is being conducted to verify the effectiveness of the cap installed as part of the Time-Critical Removal Action to reduce precipitation infiltration and leaching of contaminants and to confirm that contamination is not migrating through the soil, into the groundwater, and ultimately discharging to the Thames River. This groundwater monitoring is part of the post-closure associated with the DRMO cap.

To meet this objective, five existing Phase I and Phase II RI monitoring wells and five monitoring wells installed during Rounds 1 and 2 of the DRMO Groundwater Monitoring Program were sampled and analyzed for a suite of analytes based on an evaluation of site history and previous analytical results. Sampling and analyses were performed in accordance to the Groundwater Monitoring Plan (GMP) prepared for the DRMO (B&R Environmental, February 1998).

Because this is an interim report for the seventh round of groundwater monitoring, evaluation of monitoring results is limited to a comparison of these results to the criteria identified in the DRMO GMP (B&R Environmental, February 1998).

1.3 REPORT ORGANIZATION

This report has been prepared in the following format to address the requirements for long-term groundwater monitoring at the DRMO. Section 1.0 of the report is this brief introduction including the project scope and objective. Section 2.0 describes field sampling activities. Section 3.0 presents and evaluates the analytical results from the sampling effort.

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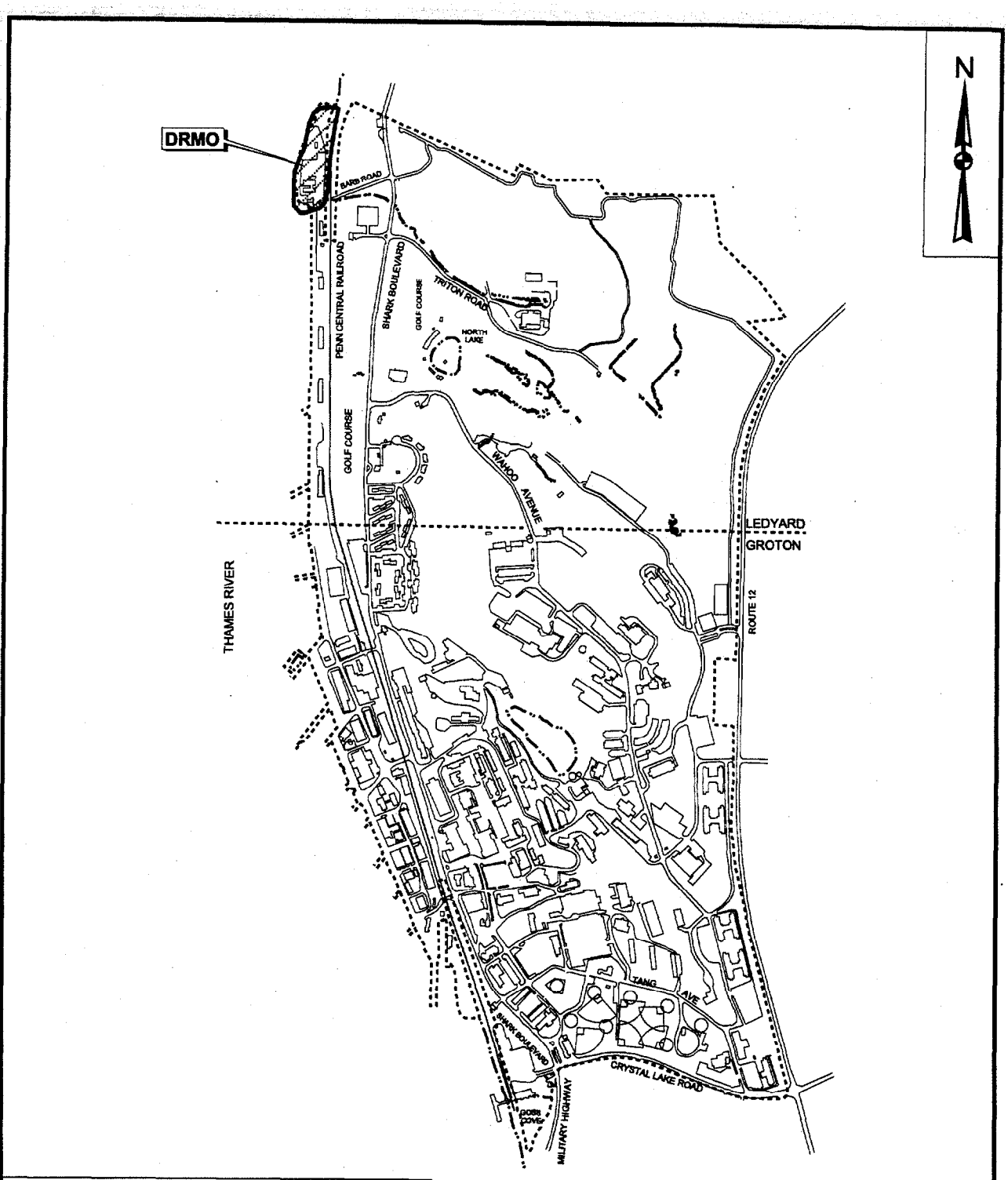

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COST/SCHEDULE-AREA		APPROVED BY: — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE 1-1	REV: 0

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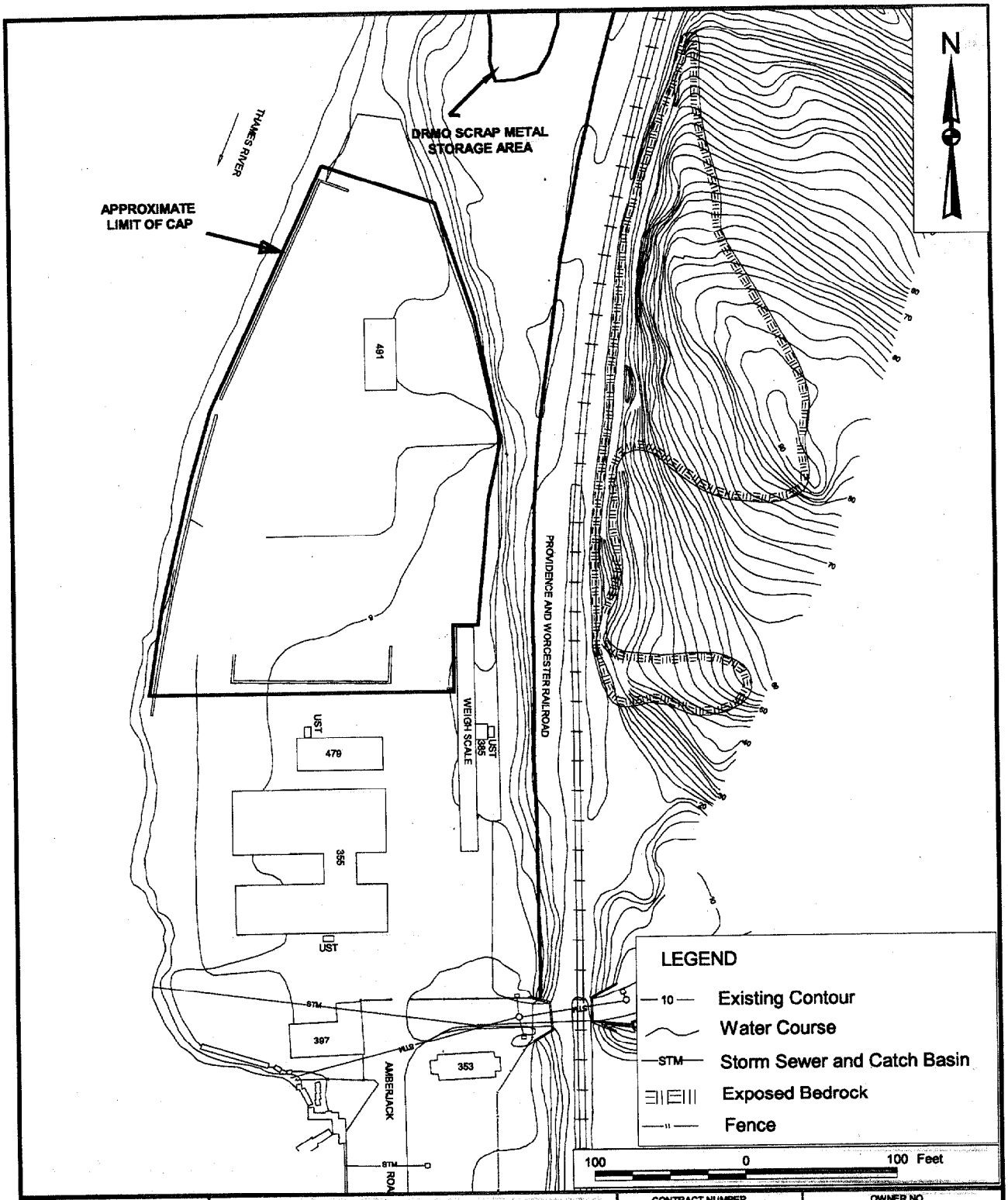

DRAWN BY: J. BELLONE	DATE: 10/1/99	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 7363 / OWNER NO.
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COST/SCHEDULE-AREA			APPROVED BY / DATE
SCALE: AS NOTED			DRAWING NO.: FIGURE 1-2 / REV: 0

P:\GIS\NLON\7363ANNUAL.APR 10/1/99 JCB DRMO SITE PLAN LAYOUT

2.0 FIELD INVESTIGATION ACTIVITIES

Field investigation activities as part of the seventh round of groundwater monitoring included two rounds of groundwater level measurements and groundwater sampling of 10 monitoring wells. Monitoring well locations are shown on Figure 2-1. These activities were performed in accordance with the procedures and methodologies described in Section 3.0: Groundwater Monitoring System Installation and Section 4.0: Sampling and Analyses of the DRMO GMP (B&R Environmental, February 1998). A copy of the field activity log book is provided as Appendix A.

2.1 WATER LEVEL MEASUREMENTS

Water levels were measured in ten monitoring wells and one staff gage (in the Thames River). The staff gage was located at the outside edge of the storm sewer outfall leading to the Thames River, west of Building 397. The measurements were collected on January 18 and 20, 2000, within time periods of 11 minutes prior to and 11 minutes following the predicted high tide on January 20 and 17 to 44 minutes following the predicted low tide on January 18 for Smith Cove, opposite the DRMO on the Thames River. Tide tables are provided in Appendix B. Table 2-1 summarizes the groundwater measurements, and Figures 2-2 and 2-3 illustrate the potentiometric surface maps for the groundwater in the shallow aquifer during low tide and high tide, respectively. Groundwater level measurement sheets can be found in Appendix C.

2.2 GROUNDWATER SAMPLING

Ten monitoring wells were sampled during the seventh round of groundwater monitoring using low-flow purging and sampling techniques, in accordance with USEPA Region I Low-Flow Purging and Sampling Procedure GW-001.

The wells were purged prior to sampling using the dedicated bladder pumps with bottled nitrogen gas as the power source. Groundwater quality parameters, including pH, specific conductivity, temperature, dissolved oxygen, salinity, and Eh were measured during purging at 5 minute intervals using a YSI 610 DM datalogger and 6820 multi-parameter water quality monitor equipped with a flow-through cell. Turbidity was also measured using a LaMotte 2020 Turbidimeter. Calibration log sheets are found in Appendix D. Water levels were also measured during purging at 5-minute intervals. Purging continued until the above parameters stabilized. Copies of the low-flow purge data sheets are provided in Appendix E. All purge water was containerized in 55-gallon drums for off-site disposal by a disposal subcontractor, as discussed in Section 2.3.

Following purging, samples were collected directly from the discharge end of the Teflon®-lined pump tubing. The groundwater samples were collected and analyzed for VOCs, SVOCs, PAH, pesticides and PCBs, and total metals. Analytical results of the samples are discussed in Section 3.0. Copies of the sample log sheets are provided in Appendix E, and chain of custody records are provided in Appendix F.

2.3 DECONTAMINATION AND INVESTIGATION-DERIVED WASTE

All water quality and water level meters were decontaminated by rinsing with de-ionized water prior to and after use.

All investigation derived waste (IDW) (i.e., purge water) was turned over to NSB-NLON and disposed of offsite by a licensed disposal company.

TABLE 2-1

GROUNDWATER LEVEL MEASUREMENTS AND ELEVATIONS
GROUNDWATER WATER MONITORING REPORT
DRMO, NSB-NLON, GROTON, CONNECTICUT

Well Number	Reference Elevation[1] (feet msl)	Depth to Water[2] (feet) LOW TIDE	Depth to Water[3] (feet) HIGH TIDE	Groundwater Elevation (feet msl) LOW TIDE	Groundwater Elevation (feet msl) HIGH TIDE	Well Screen Depth[4]
6MW1S	8.63	7.20	3.74	1.43	4.89	Shallow
6MW2S	7.30	5.83	2.29	1.47	5.01	Shallow
6MW2D	7.85	5.44	3.85	2.41	4.00	Deep
6MW6S	12.16	8.79	8.49	3.37	3.67	Shallow
6MW6D	12.50	9.11	8.95	3.39	3.55	Bedrock
6MW9S	7.52	4.30	3.48	3.22	4.04	Shallow
6MW10S	5.19	3.58	0.35	1.61	4.84	Shallow
6MW10D	5.01	2.17	0.45	2.84	4.56	Deep
6MW11S	4.92	3.36	0.00 [5]	1.56	4.92	Shallow
6MW11D	5.31	2.60	0.77	2.71	4.54	Deep
SG-01	5.67	4.31	0.70	1.36	4.97	NA

msl: mean sea level (1982 Base Traverse System)

NOTES:

1 Reference elevation is top of well casing (1982 Base Traverse System)
2 Depth to water is from top of well casing. Measured January 18, 2000.
3 Depth to water is from top of well casing. Measured January 20, 2000.
4 Well screen depths designated as shallow unconfined, deep unconfined, and bedrock groundwater.
5 6MW11S water level was 0.10 feet above the top of the PVC riser at time of high tide measurement.

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P:\GIS\NLON\7363_267.APR GW SAMPLING DRMO LOCATION BV LAYOUT 1/14/00 JCB

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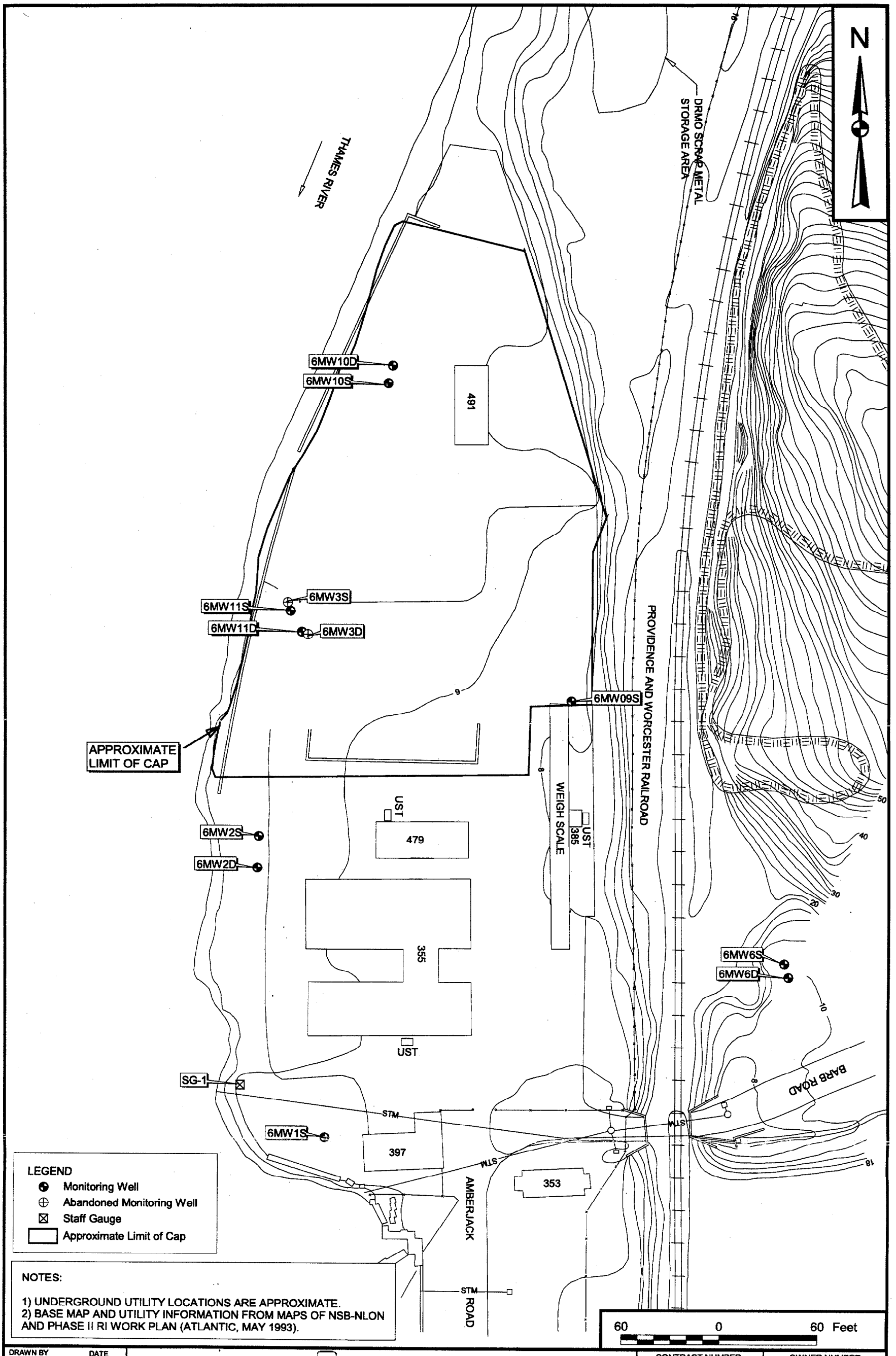

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COST/SCHEDULE-AREA		APPROVED BY — DATE —	
SCALE AS NOTED		DRAWING NO. FIGURE 2-1	REV 0

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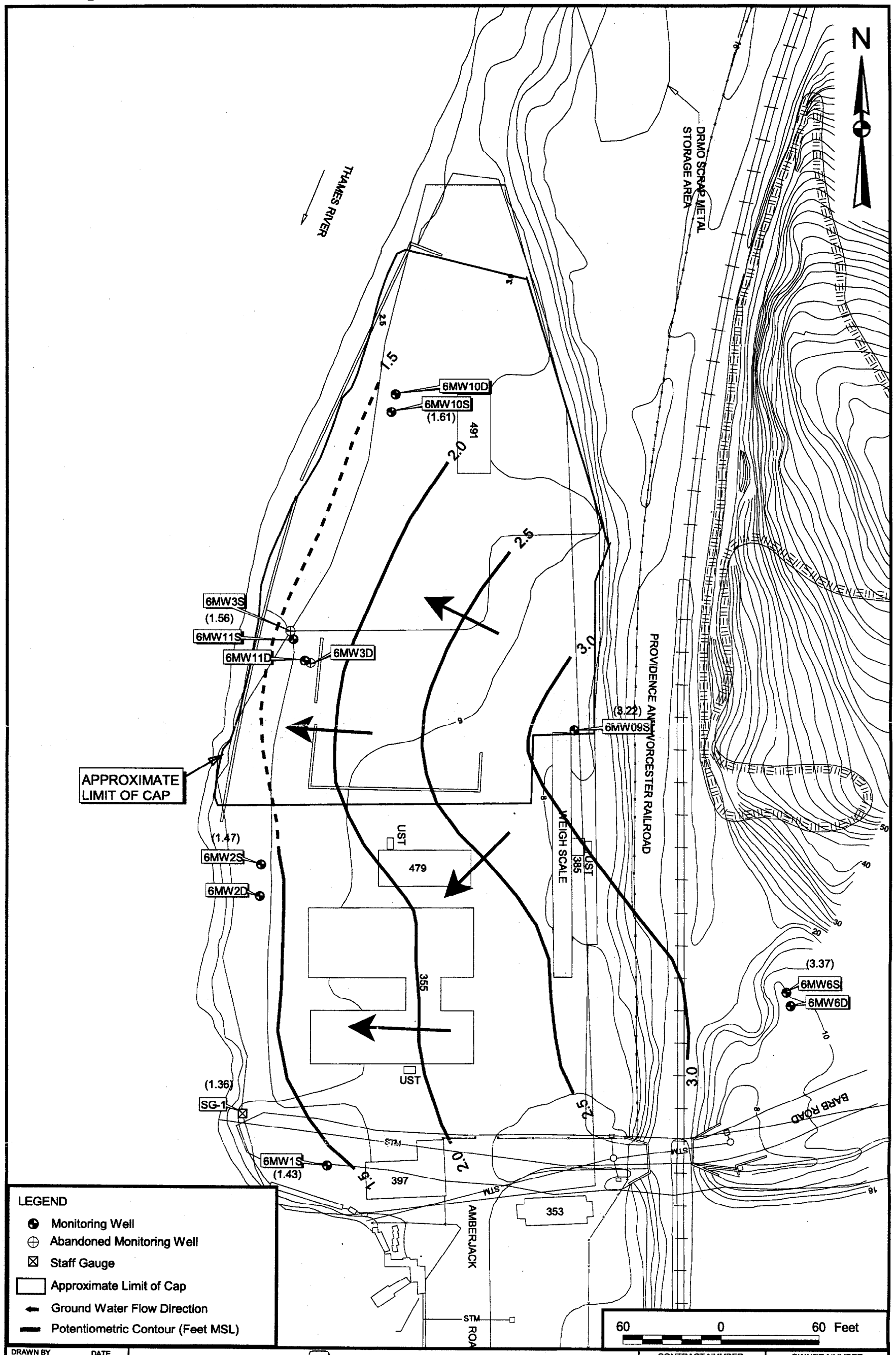

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COST/SCHEDULE-AREA			APPROVED BY — DATE —
SCALE AS NOTED			DRAWING NO. FIGURE 2-2 / REV 0

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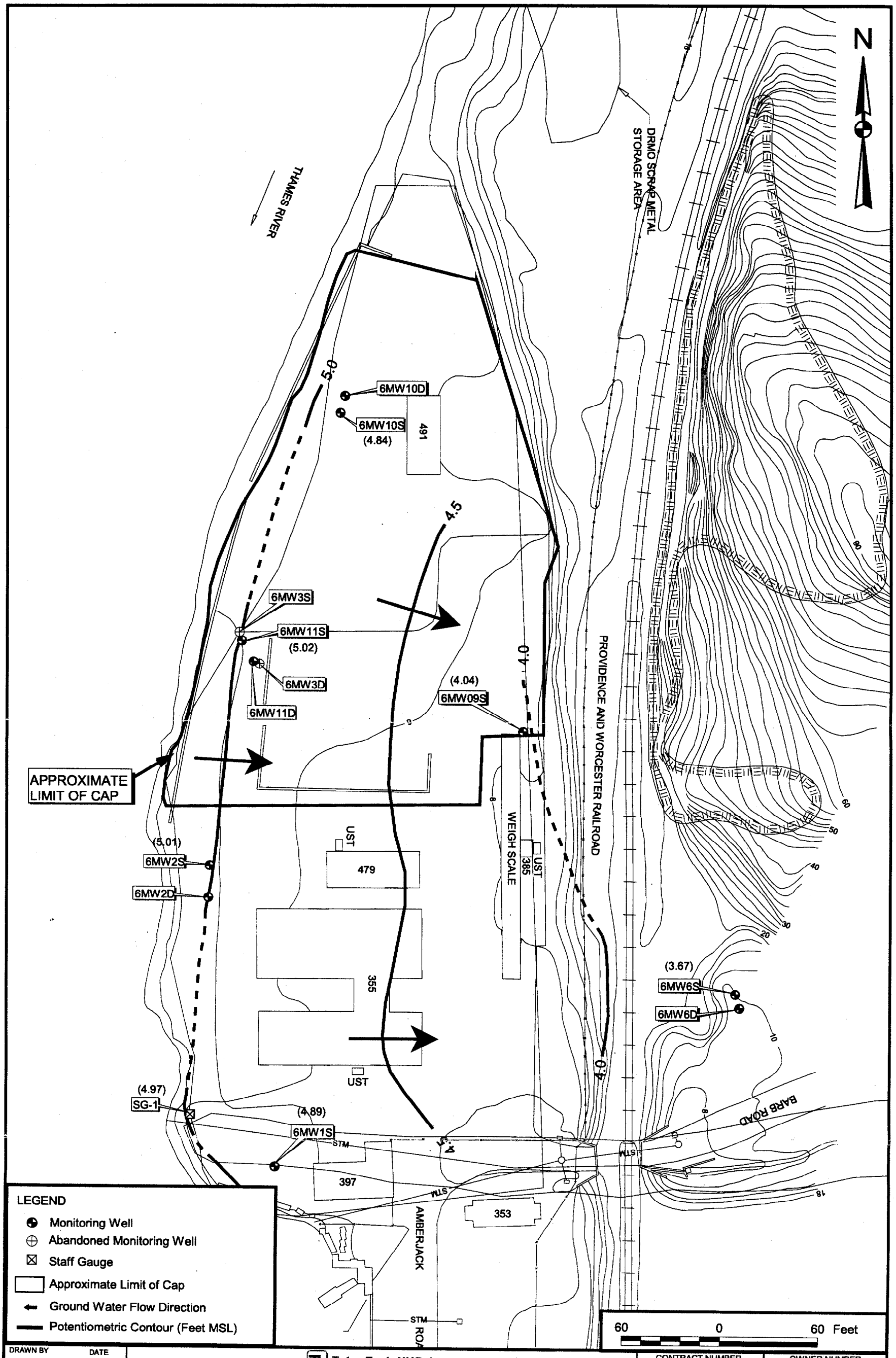

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COST/SCHEDULE-AREA			APPROVED BY — DATE —
SCALE AS NOTED			DRAWING NO. FIGURE 2-3 / REV 0

3.0 MONITORING RESULTS

The groundwater samples collected from monitoring wells 6MW1S, 6MW2S, 6MW2D, 6MW6S, 6MW6D, 6MW9S, 6MW10S, 6MW10D, 6MW11S, and 6MW11D were analyzed for Target Compound List (TCL) organic chemicals and Target Analyte List (TAL) inorganic chemicals. Monitoring focused on the following organic and inorganic chemicals of potential concern, as identified in the GMP Monitoring Plan (B&R Environmental, February 1998):

- 1,1,2,2-Tetrachloroethane
- 1,2-Dichloroethane
- 1,2-Dichloroethene (total)
- Trichloroethene
- Vinyl Chloride
- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Benzo(k)fluoranthene
- Benzoic Acid
- Bis(2-ethylhexyl)phthalate
- Fluoranthene
- Fluorene
- Naphthalene
- Phenantrene
- Pyrene
- Heptachlor Epoxide
- Aroclors 1254 & 1260
- Hexachlorobiphenyl
- 4,4'-DDD
- Arsenic
- Barium
- Cadmium
- Chromium
- Copper
- Lead
- Silver
- Zinc

The contaminants listed were detected in soil either at concentrations that could result in exceedances of site specific Surface Water Protection Criteria (SWPCs) or at concentrations that exceed Connecticut's Pollutant Mobility Criteria for GB groundwater.

Analytical results are summarized on Table 3-1 and the positive COC detections are shown on Figure 3-1. Table 3-1 also compares the analytical results with the primary and secondary monitoring criteria, as established in the GMP (B&R Environmental, February 1998). Chemicals exceeding either primary or secondary monitoring criteria are noted by shading. The results of this comparison may be summarized as follows:

- There were no organic and inorganic exceedances of the primary monitoring criteria, which were site-specific SWPCs using a dilution factor of 100. Additionally, there were no organic exceedances of secondary monitoring criteria, which is the Federal AWQC and the Connecticut WQS for protection of human health from consumption of aquatic organisms

- Arsenic was detected in the sample from monitoring wells 6MW10D at a concentration of 4.2 µg/L. This concentration exceeded the secondary monitoring criteria (AWQCs and WQSs for protection of human health from consumption of aquatic organisms) of 0.14 µg/L for arsenic.

- Copper was detected in the sample from monitoring well 6MW2S at a concentration of 7.5 µg/L. This concentration exceeded the secondary monitoring criterion of 2.4 µg/L, which is the Federal AWQC for the protection of aquatic life (chronic, saltwater).

- Zinc was detected in the samples from monitoring wells 6MW9S (111 µg/L), 6MW9S-D (120 µg/L), and 6MW10S (91.5 µg/L). These detections slightly exceeded the secondary monitoring criterion of 81 µg/L, which is the Federal AWQC for protection of aquatic life (chronic, saltwater).

- No other exceedances of secondary monitoring criteria were noted.

As discussed in Section 1.2, because this is only an interim report for the seventh round of groundwater monitoring, the evaluation of the analytical results is limited to the above comparison. No conclusions or recommendations are drawn from this comparison. Initial conclusions and recommendations were made in the Year 1 Summary Report. Additional conclusions and recommendations will be noted upon the completion of the second year of sampling (four rounds).

Data validation letters and laboratory data sheets are attached to this report as Appendix G.

TABLE 3-1

ROUND 7 ANALYTICAL RESULTS SUMMARY
INTERIM GROUNDWATER MONITORING REPORT
DRMO, NSB-NLON, GROTON, CONNECTICUT
PAGE 1 OF 2

Chemical	Primary Monitoring Criterion [1]	Secondary Monitoring Criterion [1]	6MW1S ROUND 7 01/21/00	6MW2D ROUND 7 01/20/00	6MW2S ROUND 7 01/20/00	6MW6D ROUND 7 01/18/00	6MW6S ROUND 7 01/18/00	6MW9S ROUND 7 01/19/00
VOCs (ug/L)								
1,1,2,2-TETRACHLOROETHANE	1,100	11 [3][4]	1 U	1 U	1 U	1 U	1 U	1 U
1,2-DICHLOROETHANE	29,700	99 [3][4]	1 U	1 U	1 U	1 U	1 U	1 U
CIS-1,2-DICHLOROETHENE	NA	NA	1 U	0.9 J	1 U	5	1 U	1
TRANS-1,2-DICHLOROETHENE	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U
TRICHLOROETHENE	23,400	81 [3][4]	1 U	1 U	1 U	9	0.5 J	1 U
VINYL CHLORIDE	157,500	525 [3][4]	1 U	0.8 J	1 U	1 U	1 U	1 U
SVOCs (ug/L)								
BENZO(A)ANTHRACENE	3.0	0.049 [3][4]	0.17 U	0.15 U	0.15 U	0.16 U	0.15 U	0.16 U
BENZO(A)PYRENE	3.0	0.049 [3][4]	0.17 U	0.15 U	0.15 U	0.16 U	0.15 U	0.16 U
BENZO(B)FLUORANTHENE	3.0	0.049 [3][4]	0.17 U	0.15 U	0.15 U	0.16 U	0.15 U	0.16 U
BENZO(K)FLUORANTHENE	3.0	0.049 [3][4]	0.17 U	0.15 U	0.15 U	0.16 U	0.15 U	0.16 U
BENZOIC ACID	NA	NA	20 U	20 UJ	20 UJ	21 UJ	20 UJ	21 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	590	5.9 [3][4]	2	2 U	2 U	2.1 U	2 U	2.1 U
FLUORANTHENE	37,000	370 [3][4]	1.1 U	1 U	1 U	1 U	1 U	1.1 U
FLUORENE	1,400,000	14,000 [3][4]	1.1 U	1 U	1 U	1 U	1 U	1.1 U
NAPHTHALENE	NA	NA	1.1 U	1 U	1 U	1 U	1 U	1.1 U
PHENANTHRENE	0.77	NA	1.1 U	1 U	1 U	1 U	1 U	1.1 U
PYRENE	1,100,000	11,000 [3][4]	1.1 U	1 U	1 U	1 U	1 U	1.1 U
Pesticides/PCBs (ug/L)								
4,4'-DDD	NA	0.00084 [3][4]	0.02 U	0.021 U	0.021 U	0.021 U	0.02 U	0.02 U
AROCLOR-1254	5.0	0.00017 [3][4]	0.2 U	0.21 U	0.21 U	0.21 U	0.2 U	0.2 U
AROCLOR-1260	5.0	0.00017 [3][4]	0.2 U	0.21 U	0.21 U	0.21 U	0.2 U	0.2 U
HEPTACHLOR EPOXIDE	0.5	0.00011 [3][4]	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Inorganics (total/dissolved) (ug/L)								
ARSENIC	40	0.14 [3][4]	2.6 UJ	2.6 UJ	2.6 UJ	2.6 U	2.6 U	2.6 U
BARIUM	NA	NA	21.5	174	28.1	39.3	27.6	14.6
CADMIUM	60	NA	0.30 U	0.33 U	0.60 U	0.45 U	0.36 U	0.54 U
CHROMIUM	1,100	50 [2]	1.0 U	2.4 U	1.0 U	1.0 U	1.0 U	1.0 U
COPPER	480	2.4 [2]	1.3 U	3.2 U	7.5	1.3 U	1.3 U	3.0 U
LEAD	130	8.1 [2]	1.8 UJ	1.8 U	6.1 U	1.8 U	1.8 U	1.8 U
SILVER	120	1.9 [2]	1.1 U	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ
ZINC	1,230	81 [2]	4.5 J	27.0 J	36.9 J	13.3 J	3.8 U	111

NOTES:

Bold numbers denote exceedance of secondary monitoring criterion. There are no exceedances of primary monitoring criteria.

1 Surface Water Protection Criteria for substances in groundwater, using a site-specific dilution factor of 100.
2 Federal Ambient Water Quality Criteria for protection of aquatic life (chronic, saltwater).
3 Federal Ambient Water Quality Criteria for protection of human health from consumption of organisms.
4 Connecticut Water Quality Criteria for protection of human health from consumption of organisms.
J Estimated Value
R Rejected Value
U Undetected
NA Not Available

TABLE 3-1

ROUND 7 ANALYTICAL RESULTS SUMMARY
INTERIM GROUNDWATER MONITORING REPORT
DRMO, NSB-NLON, GROTON, CONNECTICUT
PAGE 2 OF 2

Chemical	Primary Monitoring Criterion [1]	Secondary Monitoring Criterion [1]	6MW9S (DUP) ROUND 7 01/19/00	6MW10D ROUND 7 01/18/00	6MW10S ROUND 7 01/18/00	6MW11D ROUND 7 01/19/00	6MW11S ROUND 7 01/19/00
VOCs (ug/L)							
1,1,2,2-TETRACHLOROETHANE	1,100	11 [3][4]	1 U	1 U	1 U	1 U	1 U
1,2-DICHLOROETHANE	29,700	99 [3][4]	1 U	1 U	1 U	1 U	1 U
CIS-1,2-DICHLOROETHENE	NA	NA	1 U	15	0.9 J	1 U	1 U
TRANS-1,2-DICHLOROETHENE	NA	NA	1 U	1 U	1 U	1 U	1 U
TRICHLOROETHENE	23,400	81 [3][4]	1 U	5	1 U	1 U	1 U
VINYL CHLORIDE	157,500	525 [3][4]	1 U	1 U	1 U	1 U	1 U
SVOCs (ug/L)							
BENZO(A)ANTHRACENE	3.0	0.049 [3][4]	0.16 U	0.16 U	0.15 U	0.15 U	0.16 U
BENZO(A)PYRENE	3.0	0.049 [3][4]	0.16 U	0.16 U	0.15 U	0.15 U	0.16 U
BENZO(B)FLUORANTHENE	3.0	0.049 [3][4]	0.16 U	0.16 U	0.15 U	0.15 U	0.16 U
BENZO(K)FLUORANTHENE	3.0	0.049 [3][4]	0.16 U	0.16 U	0.15 U	0.15 U	0.16 U
BENZOIC ACID	NA	NA	21 UJ	21 UJ	20 UJ	20 UJ	20 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	590	5.9 [3][4]	2.1 U	2.1 U	4.1	2 U	2 U
FLUORANTHENE	37,000	370 [3][4]	1.1 U	1.1 U	1 U	1 U	1.1 U
FLUORENE	1,400,000	14,000 [3][4]	1.1 U	1.1 U	1 U	1 U	1.1 U
NAPHTHALENE	NA	NA	1.1 U	1.1 U	1 U	1 U	1.1 U
PHENANTHRENE	0.77	NA	1.1 U	1.1 U	1 U	1 U	1.1 U
PYRENE	1,100,000	11,000 [3][4]	1.1 U	1.1 U	1 U	1 U	1.1 U
Pesticides/PCBs (ug/L)							
4,4'-DDD	NA	0.00084 [3][4]	0.021 U	0.02 U	0.02 U	0.02 U	0.02 U
AROCLOR-1254	5.0	0.00017 [3][4]	0.21 U	0.2 U	0.2 U	0.2 U	0.2 U
AROCLOR-1260	5.0	0.00017 [3][4]	0.21 U	0.2 U	0.2 U	0.2 U	0.2 U
HEPTACHLOR EPOXIDE	0.5	0.00011 [3][4]	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Inorganics (total/dissolved) (ug/L)							
ARSENIC	40	0.14 [3][4]	2.6 U	**4.2 J**	2.6 U	2.6 UJ	2.6 U
BARIUM	NA	NA	14.4	44.8	127	280	89.4
CADMIUM	60	NA	0.61 U	0.37 U	1.2 U	0.30 UJ	0.64 U
CHROMIUM	1,100	50 [2]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
COPPER	480	2.4 [2]	2.9 U	1.3 U	4.9 U	1.9 U	5.0 U
LEAD	130	8.1 [2]	1.8 U	1.8 U	1.8 U	1.8 U	2.7 U
SILVER	120	1.9 [2]	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ
ZINC	1,230	81 [2]	**120**	77.6	**91.5**	8.7 J	77.4

NOTES:

Bold numbers denote exceedance of secondary monitoring criterion. There are no exceedances of primary monitoring criteria.

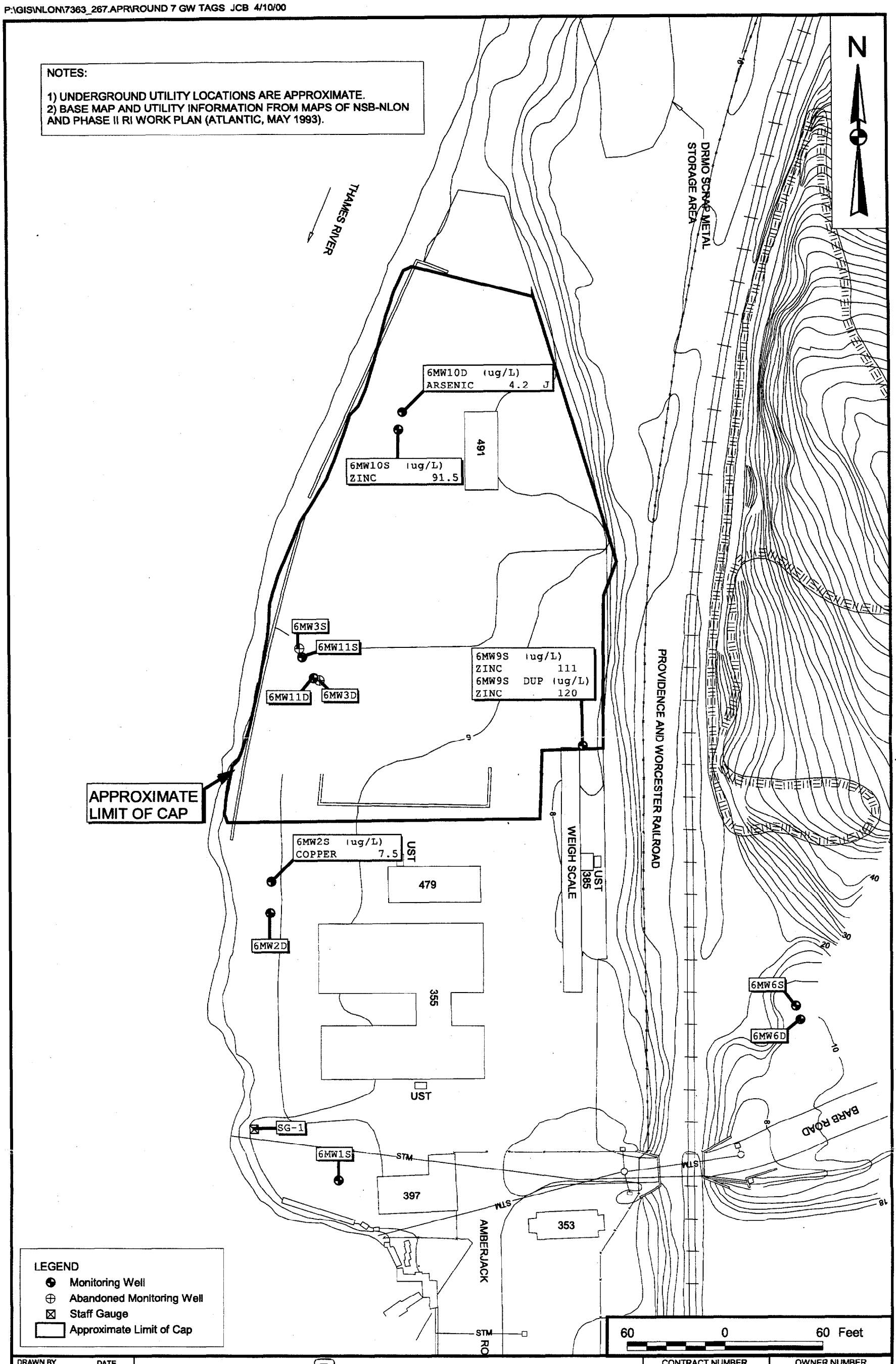
1 Surface Water Protection Criteria for substances in groundwater, using a site-specific dilution factor of 100.
2 Federal Ambient Water Quality Criteria for protection of aquatic life (chronic, saltwater).
3 Federal Ambient Water Quality Criteria for protection of human health from consumption of organisms.
4 Connecticut Water Quality Criteria for protection of human health from consumption of organisms.
J Estimated Value
R Rejected Value
U Undetected
NA Not Available

P:\GIS\NLON\7363_267.APR\ROUND 7 GW TAGS JCB 4/10/00

040010/P

NOTES:

1) UNDERGROUND UTILITY LOCATIONS ARE APPROXIMATE.
2) BASE MAP AND UTILITY INFORMATION FROM MAPS OF NSB-NLON AND PHASE II RI WORK PLAN (ATLANTIC, MAY 1993).



DRAWN BY J. BELLONE	DATE 4/10/00	Tetra Tech NUS, Inc.	CONTRACT NUMBER 7363 / OWNER NUMBER —
CHECKED BY MLM	DATE 4/12/00	POSITIVE COC DETECTION ROUND 7 GROUNDWATER SAMPLING DRMO NSB-NLON, GROTON, CONNECTICUT	APPROVED BY Mark L. Mengel DATE 4/12/00
COST/SCHEDULE-AREA			APPROVED BY — DATE —
SCALE AS NOTED			DRAWING NO. FIGURE 3-1 / REV 0

DRAFT

3-5

CTO 0267

1123B02Z

REFERENCES

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(CT, 1995): "Standards for Quality of Public Drinking Water." Title 19, Regulation 19-13, Section 19-13-B102. State of Connecticut

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(SCS, 1983): Soil Survey of New London County Connecticut. Soil Conversation Service.

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(USGS, 1967): Bedrock Geologic Map of the Uncasville Quadrangle, New London County, Connecticut. United States Geological Survey.

APPENDIX A

FIELD ACTIVITIES LOG BOOK

TITLE NSB-NLON PROJECT NO. 7363

Monday 1/17/00 BOOK 2415

Work continued from Page WEATHER: Clear windy 4-15°F.

0710 SN arrives at PSH Airport - meets up w/ Keith Simpson (KS).

0805 SN + KS depart for NSB-NLON on flight #1430 to Providence, RI.

1230 Arrive on site at NSB-NLON. SN and KS unpack equipment.

1400 KS + SN depart for water levels at Area A (see Logbook # 12445).

1705 Arrive at building 166 after Area A water levels. Begin calibration of equipment, bottle prep, and equipment prep for Demo sampling on 1/18/00.

1900 KS + SN depart site for hotel.

SN 1/17/00 VOID

Work continued to Page

SIGNATURE Scott Reid DATE 1/17/00

WITNESS DATE

176

TITLE NSB-NLON PROJECT NO. 7363

Tuesday 1/18/00 BOOK 2415

Work continued from Page WEATHER (cont): Clear and cold, 2-10°F.

0645 SN + KS arrive at guard gate to get passes.

0705 SN + KS arrive at BLDG 166 and begin loading equipment into vehicles for ~~site work~~ (SN) levels (SN) and sampling at Demo.

0730 Darlene arrives at BLDG 166 - KS and SN brief her of the activities for the shift.

0740 KS + SN depart for Demo.

0747 KS + SN arrive at non-tidal wells 6MW65 + 6MW6D.

0807 SN begins purging 6MW65. (SN) PID ~~reading~~ reading = 0.0, static H_2O level = 9.75 Ft, one casing volume = 1.4 gallons. Refer to Low Flow Purge Data Sheet for 6MW65 for specific purge data.

0812 KS begins purging 6MW6D. Refer to cont'

Work continued to Page

SIGNATURE Scott Reid DATE 1/18/00

WITNESS DATE

177

TITLE NSB-NLON PROJECT NO. 7363

Tues 1/18/00 BOOK 2415

Work continued from Page

to the Low Flow Purge Data Sheet for well 6MW6D for specific purge data.

0905 SN begins sampling 6MW6S - Sample ID DRMO-6MW6S-GW-07. Refer to GW Sample Log sheet for this well/sample for specific sampling data.

0915 KS begins sampling 6MW6D - Sample ID DRMO-6MW6D-GW-07. Refer to GW Sample Log Sheet for this well/sample for specific sampling data.

0935 SN ends sampling and loads equip. in vehicle.

0943 KS ends sampling. SN & KS load vehicle with equipment and depart for BLDG 166.

1000 KS & SN arrive at BLDG 166. KS departs to pick up IDW drums. SN preps equipment and sample bottles for DRMO sampling.

Work continued to Page 179

SIGNATURE Scott W. Reid DATE 1/18/00

WITNESS DATE

TITLE NSB-NLON PROJECT NO. 7363

TUES 1/18/00 BOOK 2415

Work continued from Page 178

1030 KS returns to BLDG. 166

1045 KS & SN depart for Lunch.

1125 KS & SN arrive at DRMO. Dump purge water into 55-gallon drum and proceed to wells 6MW10D and 10S.

1155 KS sets up on well 6MW10D, SN sets up on well 6MW10S.

1210 KS begins purging of well 6MW10D. Refer to the Low Flow Purge Data Sheet for well # 6MW10D for specific purge data.

1220 SN begins purging well 6MW10S. Refer to the L.F. Purge Data Sheet for well # 6MW10S for specific purge data.

1315 KS begins sampling. Sample ID is DRMO-6MW10D-GW-07. This well has an MS/MSD associated with it. (con't)

Work continued to Page 180

SIGNATURE Scott W. Reid DATE 01/18/00

WITNESS DATE

TITLE NSB-NLON PROJECT NO. 7363

BOOK 2415

Work continued from Page 179

Refer to the GW Sample Log Form associated with sample DRMD-6MW10D-GW-07 for specific sampling info.

1315 SW begins sampling. Sample ID is DRMD-6MW10S-GW-07. Refer to the GW sample Log Sheet for this sample for specific sampling info.

1350 SW ends sampling. Preps for Low Tide water levels.

1355 SW begins Low Tide water levels.

1415 SW arrives back at well 6MW10D-KS continues Low Tide water levels. SW finishes sampling 6MW10D. Loads equipment in vehicle.

1422 KS ends Low Tide water levels. Cap wells 6MW10S and 10D. Proceed to dump purge water into IDW drum. Depart DRMO.

1450 KS & SW arrive at Bldg 16. Unload vehicles

Work continued to Page 181/182

SIGNATURE Scott Neu

WITNESS

DATE 1/18/00

DATE

TITLE NSB-NLON PROJECT NO. 7363

BOOK 2415

Work continued from Page 180 (SW)

Sample Summary (Round 7)

WELL #	DATE SAMPLED	TIME	COMMENTS
6MW1S	1.21.00	1525	
6MW2S	1.20.00	1500	
6MW2D	1.20.00	1510	
6MW6S	1/18/00	0905	
6MW6D	1/18/00	0915	
6MW9S	1.19.00	0840	DUP BLACK SUSPENDED FINES SULFIDIC ODOR
6MW10S	1/18/00	1315	MS/MSD
6MW10D	1/18/00	1315	
6MW11S	1.19.00	1415	
6MW11D	1.19.00	1433	

Work continued to Page

SIGNATURE Scott Neu

WITNESS

DATE 1/19/00

DATE

TITLE NSB-NLON

PROJECT NO. 7363

BOOK 2415

Work continued from Page 180

WEATHER (PM): WINDY, COLD, 15-22°F.

1650 KS & SN GO WALMART FOR SUPPLIES, THEN TO LUNCH.

SUN 1/18/00

Work continued to Page

SIGNATURE Scott Neu

WITNESS

DATE 1/18/00

DATE

TITLE NSB-NUN

WED. 1.19.00

PROJECT NO. 7365

BOOK 2415

Work continued from Page WEATHER: OVC, CLEAR 3-22°F

0650 KS & SN @ BLD 166 CAL & LOAD EQUIPMENT. SCOTT WORKING ON AREA A. KS ON MW9 @ ORMO

0918 COMPLETE PURGE & SAMPLING @ 6MW9S ALSO COLLECTED DUP @ THIS WELL GWFD 011900

LOAD TRUCK TO BLD 166

0935 PAPER WORK & PREP FOR GW SAMPLING TO AREA A HELP SCOTT WITH PURGING THEN LUNCH

1200 RETURN TO BLD 166 LOAD SUV'S FOR SAMPLING @ ORMO

1235 TO ORMO & SET-UP ON 11S & D COMPLETE PURGING & SAMPLING, LOAD

1500 SUV'S TO BLD 166. CLEAN EQUIP. PAPER WORK PREP FOR HIGH TIDE WATER LEVELS & SAMPLING AT AREA A

SEE ALSO 03 BOOK FOR AREA A

Work continued to Page

SIGNATURE K-1 S. Sumi

WITNESS

DATE 1.19.00

DATE

TITLE NSB NOLA PROJECT NO. 7363

THUR. 1.20.00 BOOK 2415

Work continued from Page WEATHER: SNOW, COLD 8-22 °F

0650 SCOTT NEIL & KEITH SIMPSON @ BLD 166 PREP FOR HIGH TIDE W/L THEN SAMPLING @ AREA A

0905 TO DRMO COMPLETE HIGH TIDE W/L @ 0935 RETURN TO BLD 166, LOAD SUV's FOR AREA A

1348 RS & SN TO DRMO SET-UP ON 2S & D COMPLETE PURGE & SAMPLING OF 6MW2S & D

1535 RETURN TO BLD 166 UNLOAD SUV's PAPER WORK & PREP FOR 1.21.00 SAMPLING @ AREA A

Work continued to Page

SIGNATURE WITNESS

DATE 1.20.99

184

TITLE NSB NOLA PROJECT NO. 7363

FRIDAY 1.21.00 BOOK 2415

Work continued from Page WEATHER: COLD, WINDY 5-20°F LITE SNOW THUR. PM

1310 TO DRMO K. SIMPSON, SCOTT IS WORKING AT AREA A. SET-UP TO PURGE & SAMPLE @ 6MW1S. "LAST" WELL.

1600 COMPLETE SAMPLING @ DRMO 10 WELLS SAMPLED ALL PURGE WATER WAS DUMPED INTO A DRUM LABELED & SUPPLIED BY THE BASE THEY WILL REMOVE DRUM FROM DRMO NEXT WEEK

1635 NITROGEN CYL. RETURNED TO BOC CASES. WILL CLEAN/PACK & RETURN RENTED EQUIPMENT THIS WEEKEND

END ROUND 7

DRMO

Work continued to Page

SIGNATURE WITNESS

DATE 1.21.00

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APPENDIX B

TIDE TABLES

All times listed are in Local Time, and all heights are in Feet.

New London, Connecticut
Tide Predictions (High and Low Waters) December, 1999
NOAA, National Ocean Service

Standard Time

Day	Time	Ht.	Time	Ht.	Time	Ht.	Time	Ht.
1 W	421am H	2.7	1038am L	0.3	443pm H	2.5	1057pm L	0.2
2 Th	519am H	2.8	1137am L	0.2	544pm H	2.4	1148pm L	0.2
3 F	609am H	2.9	1229pm L	0.2	635pm H	2.3		
4 Sa	1234am L	0.2	652am H	2.9	117pm L	0.1	718pm H	2.3
5 Su	118am L	0.2	730am H	3.0	200pm L	0.1	757pm H	2.3
6 M	159am L	0.3	806am H	3.0	241pm L	0.0	834pm H	2.3
7 Tu	240am L	0.3	841am H	3.0	322pm L	0.0	911pm H	2.3
8 W	320am L	0.3	916am H	3.0	402pm L	0.0	948pm H	2.3
9 Th	402am L	0.4	952am H	3.0	444pm L	0.0	1028pm H	2.3
10 F	445am L	0.5	1029am H	2.9	527pm L	0.1	1109pm H	2.3
11 Sa	530am L	0.6	1107am H	2.8	611pm L	0.1	1153pm H	2.3
12 Su	618am L	0.6	1149am H	2.7	658pm L	0.2		
13 M	1240am H	2.2	710am L	0.7	1235pm H	2.6	746pm L	0.2
14 Tu	130am H	2.3	806am L	0.7	127pm H	2.5	835pm L	0.3
15 W	223am H	2.4	903am L	0.6	226pm H	2.4	925pm L	0.3
16 Th	317am H	2.5	1000am L	0.5	328pm H	2.3	1015pm L	0.2
17 F	410am H	2.7	1055am L	0.3	428pm H	2.3	1104pm L	0.1
18 Sa	502am H	2.9	1149am L	0.1	526pm H	2.4	1152pm L	0.0
19 Su	553am H	3.2	1240pm L	-0.2	622pm H	2.5		
20 M	1241am L	-0.1	643am H	3.4	131pm L	-0.4	715pm H	2.6
21 Tu	130am L	-0.2	733am H	3.6	221pm L	-0.6	808pm H	2.7
22 W	221am L	-0.3	824am H	3.7	311pm L	-0.7	900pm H	2.7
23 Th	313am L	-0.3	915am H	3.7	402pm L	-0.7	953pm H	2.8
24 F	406am L	-0.3	1008am H	3.6	454pm L	-0.7	1047pm H	2.7
25 Sa	502am L	-0.2	1102am H	3.4	547pm L	-0.5	1143pm H	2.7
26 Su	601am L	-0.1	1159am H	3.1	641pm L	-0.4		
27 M	1241am H	2.7	702am L	0.0	1258pm H	2.8	737pm L	-0.2
28 Tu	142am H	2.6	805am L	0.1	201pm H	2.6	833pm L	-0.1
29 W	245am H	2.6	909am L	0.2	306pm H	2.3	929pm L	0.1
30 Th	347am H	2.6	1011am L	0.2	410pm H	2.2	1023pm L	0.2
31 F	446am H	2.6	1109am L	0.2	511pm H	2.1	1115pm L	0.2

New London, Connecticut
Tide Predictions (High and Low Waters) January, 2000
NOAA, National Ocean Service

Standard Time

Day	Time	Ht.	Time	Ht.	Time	Ht.	Time	Ht.
1 Sa	539am H	2.7	1205pm L	0.1	607pm H	2.0		
2 Su	1204am L	0.2	624am H	2.7	1253pm L	0.1	652pm H	2.0
3 M	1249am L	0.2	704am H	2.8	136pm L	0.0	732pm H	2.0
4 Tu	132am L	0.2	741am H	2.8	218pm L	0.0	810pm H	2.1
5 W	214am L	0.2	817am H	2.9	258pm L	-0.1	848pm H	2.1
6 Th	256am L	0.2	853am H	2.9	338pm L	-0.1	925pm H	2.2
7 F	337am L	0.2	929am H	2.9	418pm L	-0.2	1004pm H	2.2
8 Sa	419am L	0.3	1005am H	2.8	459pm L	-0.1	1043pm H	2.2
9 Su	503am L	0.3	1043am H	2.8	541pm L	-0.1	1123pm H	2.3
10 M	549am L	0.4	1124am H	2.7	624pm L	0.0		
11 Tu	1206am H	2.3	638am L	0.4	1207pm H	2.6	709pm L	0.0
12 W	1252am H	2.4	731am L	0.4	1256pm H	2.4	756pm L	0.1
13 Th	141am H	2.4	829am L	0.4	152pm H	2.3	845pm L	0.2
14 F	235am H	2.5	928am L	0.3	253pm H	2.2	937pm L	0.2
15 Sa	332am H	2.7	1027am L	0.1	358pm H	2.1	1030pm L	0.1
16 Su	430am H	2.9	1124am L	-0.1	501pm H	2.1	1124pm L	0.0
17 M	527am H	3.1	1220pm L	-0.3	601pm H	2.2		
18 Tu	1218am L	-0.1	623am H	3.3	[illegible]		659pm H	2.3
19 W	112am L	-0.2	718am H	3.4	[illegible]		753pm H	2.5
20 Th	205am L	-0.3	811am H	3.5	[illegible]		846pm H	2.6
21 F	259am L	-0.4	903am H	3.4	[illegible]		938pm H	2.7
22 Sa	353am L	-0.4	955am H	3.3	434pm L	-0.7	1030pm H	2.7
23 Su	447am L	-0.3	1047am H	3.1	524pm L	-0.5	1123pm H	2.7
24 M	543am L	-0.3	1140am H	2.9	615pm L	-0.4		
25 Tu	1216am H	2.7	640am L	-0.1	1235pm H	2.6	707pm L	-0.2
26 W	112am H	2.6	739am L	0.0	131pm H	2.4	800pm L	-0.1

APPENDIX C

GROUNDWATER LEVEL MEASURMENT SHEET

Tetra Tech NUS, Inc. **GROUNDWATER LEVEL MEASUREMENT SHEET**

Project: NSB-NLON Site: DRMO

Project No.: 7363 Personnel: SIMPSON / NEIL

Temperature: 13°F Date: 1.20.00

Precipitation: NONE Level Indicator Type: HERON

Tide: HIGH @ 0824 Serial Number: NUS 001

Well/Piezometer Number	Time	(A) Elevation of Reference Point (feet)*	(B) Water Level Indicator Reading (feet)*	=(A)-(B) Groundwater Elevation (feet)*	Total Well Depth (feet)*	Tidally Influenced	Comments
6MW1S	0835	8.63	3.74	4.89	15.68	Y	
6MW2S	0831	7.30	2.29	5.01	13.63	Y	
6MW2D	0832	7.85	3.85	4.00	88.84	Y	
6MW6S	0813	12.16	8.49	3.67	18.58	N	
6MW6D	0815	12.50	8.95	3.55	46.00	N	6" OPEN BOREHOLE *
6MW9S	0819	7.52	3.48	4.04	11.75	N	
6MW10S	0824	5.19	0.35	4.84	13.31	Y	
6MW10D	0823	5.01	0.45	4.56	54.06	Y	
6MW11S	0828	4.92	+0.10	5.02	13.50	Y	WATER ABOVE RISER +.1
6MW11D	0829	5.31	0.77	4.54	85.00	Y	
SG-1	0834	5.67	0.70	4.97	--	Y	River Gauge

* Measurements to the nearest 0.01 foot.

* MEASURED AT TOP OF STEEL RISER

ROUND 7

Tetra Tech NUS, Inc. — **GROUNDWATER LEVEL MEASUREMENT SHEET**

Project:	NSB-NLON	Site:	DRMO
Project No.:	7363	Personnel:	SIMPSON / NEIL
Temperature:	13°F	Date:	11 9 00 KS
Precipitation:	NONE	Level Indicator Type:	HERON
Tide:	LOW @ 1338	Serial Number:	NUS 001

Well/Piezometer Number	Time	(A) Elevation of Reference Point (feet)*	(B) Water Level Indicator Reading (feet)*	=(A)-(B) Groundwater Elevation (feet)*	Total Well Depth (feet)*	Tidally Influenced	Comments
6MW1S	1411	8.63	7.20	1.43	15.68	Y	
6MW2S	1404	7.30	5.83	1.47	13.63	Y	
6MW2D	1406	7.85	5.44	2.41	88.84	Y	
6MW6S	1420	12.16	8.79	3.37	18.58	N	
6MW6D	1419	12.50	9.11	3.39	46.00	N	6" OPEN BOREHOLE *
6MW9S	1416	7.52	4.30	3.22	11.75	N	
6MW10S	1414	5.19	3.58	1.61	13.31	Y	
6MW10D	1422	5.01	2.17	2.84	54.06	Y	
6MW11S	1355	4.92	3.36	1.56	13.50	Y	
6MW11D	1357	5.31	2.60	2.71	85.00	Y	
SG-1	1409	5.67	4.31	1.36	--	Y	River Gauge
				✓	TJ6		

* Measurements to the nearest 0.01 foot.

* MEASURED AT TOP OF STEEL RISER

APPENDIX D

MONITORING INSTRUMENT CALIBRATION LOG

EQUIPMENT CALIBRATION LOG

INSTRUMENT NAME/MODEL : YSI 610 DM

MANUFACTURER : YSI SER.# 193933R

PROJECT NAME : NSB · NION AREA · A/DRMO

PROJECT NUMBER : 5082/7363

CALIBRATION DATE	INITIAL SETTINGS	STANDARDS USED	PROCEDURE	ADJUSTMENTS MADE	FINAL SETTINGS	SIGNATURE	COMMENTS
1·18·00		SP. COND	AS PER MGR.	CALL AIL	PAR.	TSF	SP. COND.
1.19.00		1,000 uS/CM				TSF	PH 7 & 4
1.20.00						TSF	DO
1.21.00						TSF	ORP
1.22.00						TSF	
1.23.00						TSF	
1.24.00						TSF	SP. COND. 1000 uS/CM LOT 990705 EXP 7/00
							PH 7 LOT 990504 EXP 5/00
							PH 4 LOT 990601 EXP. 6/01
							ZOBELL LOT 98M0410 EXP 10/00
							FOLLOWED EQUIPMENT MANUEL FOR CALIBRATION

Instrument Rented From: US ENVIRONMENTAL

EQUIPMENT CALIBRATION LOG

INSTRUMENT NAME/MODEL : YSI 610 DM

MANUFACTURER : YSI SER.# 193454R

PROJECT NAME : NSB-NLON AREA-A/DRMO

PROJECT NUMBER : 5082/7363

CALIBRATION DATE	INITIAL SETTINGS	STANDARDS USED	PROCEDURE	ADJUSTMENTS MADE	FINAL SETTINGS	SIGNATURE	COMMENTS
1.18.00						RSP	
1.19.00						RSP	
1.20.00						RSP	SEE
1.21.00						RSP	OTHER CALIBRATION
1.22.00						RSP	LOG FOR YSI
1.23.00						RSP	
1.24.00						RSP	
1.25.00						RSP	

Instr[illegible]nt R[illegible]d Fr[illegible] US NU[illegible]NN-ITA[illegible]

EQUIPMENT CALIBRATION LOG

INSTRUMENT NAME/MODEL : PHOTOVAC 2020

MANUFACTURER : PE (SERIAL # EDFK 201)

PROJECT NAME : NSB-NLON (DEMO and AREA A)

PROJECT NUMBER : 7363/CTO 267
5082/CTO 203

CALIBRATION DATE	INITIAL SETTINGS	STANDARDS USED	PROCEDURE	ADJUSTMENTS MADE	FINAL SETTINGS	SIGNATURE	COMMENTS
1/17/00	0.0	ISOBUTYLENE	PER MAN.	NONE	100 ppm	Scott Reid	100 ppm Standard
1/18/00	0.0	"	"	"	100 ppm	Scott Reid	"
1/19/00	0.0	"	"	"	100 ppm	Scott Reid	"
1.20.00	0.0	"	"	"	100 PPM	R E S	"
1.21.00	0.0	"	"	"	100 PPM	R E S	"
1.22.00	0.0	"	"	"	100 PPM	R E S	"
1/23/00	0.0	"	"	"	100 ppm	Scott	"
1.24.00	0.0	"	"	"	100 PPM	R E S	"

Instrument Rented From: TENUS PITTSBURGH WAREHOUSE

APPENDIX E

GROUNDWATER SAMPLE LOGSHEETS AND LOW-FLOW PURGE DATA SHEETS

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / DRMO
Project No.: 7363

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: DRMO- 6MW15 GW-07
Sample Location: 6MW15
Sampled By: K. SIMPSON
C.O.C. No.: 012100-07
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

Date: 1-21-00 / Time: 1525 / Method: Low Flow/Bladder Pump	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ppt
	CLEAR	6.49	10.99	6.1	0	0	100	5.99

PURGE DATA:

Date: 1-21-00
Method: Low Flow/Bladder Pump
Monitor Reading (ppm): 0
Well Casing Diameter & Material Type: 2 PVC
Total Well Depth (TD): 15.7
Static Water Level (WL): 6.79
One Casing Volume(gal): 1.5
Start Purge (hrs): 1402
End Purge (hrs): 1522
Total Purge Time (min): 80
Total Vol. Purged (gal): 5.2

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES (LOW-LEVEL)	HCL / 4° C	40 ml Vial	3
TCL SEMIVOLATILES	4° C	Qt. Amber Glass	2
TCL PEST/PCBs	4° C	Qt. Amber Glass	2
TCL PAH	4° C	Qt. Amber Glass	2
TAL METALS (TOTAL)	HNO_3 / 4° C	L PE	1
~~TAL METALS (DISSOLVED)~~ KES	~~HNO_3 / 4° C~~	~~L PE~~	

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

K. Simpson

Tetra Tech NUS, Inc. **LOW FLOW PURGE DATA SHEET** **Well No.:** GMW15

PROJECT: NSB-NLON, DRMO
PROJECT NUMBER: 7363
SITE: DRMO
DATE: 1-24-00
WEATHER: COLD, WINDY, CLEAR 15°F
PERSONNEL: R. SIMPSON

Well Screen Depth: 5.7 / 15.7 ft.
Initial Water Level: 6.79 @ 1400 hrs.
Pump Type/Material: BLADDER/PVC
Pump Intake Depth: 12.0' TPVC
Tide Cycle: ☐ High @ ☒ Low @ 1610 ☐ Not Affected
Total Purge Volume= 5.2 (gal)/L **Total Purge Time=** 80 (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	Eh mV	Comments
1405	6.98	0	261	40R/40D	6.01	7.00	13.16	0	3.3	7.37	76	
1410	7.11	↓	248	20 PSI	6.3	6.73	20.53	0	1.6	8.48	98	
1420	7.23	↓	↓	45R/40D	5.9	6.59	18.60	0	0.5	7.29	110	
1425	7.30	↓	↓	20 PSI	6.3	6.57	18.95	0	0.5	7.31	113	
1435	7.39	↓	↓	↓	6.3	6.52	11.55	0	0.5	6.43	119	
1445	7.47	↓	↓	↓	6.4	6.51	10.76	0	0.4	6.10	123	
1455	7.62	↓	↓	↓	6.3	6.49	10.31	0	0.4	5.76	125	
1505	7.71	↓	↓	↓	6.0	6.49	11.98	0	0.1	6.08	114	
1510	7.81	↓	↓	↓	6.0	6.49	11.01	0	0	6.12	106	
1515	7.84	↓	↓	↓	6.0	6.49	10.52	0	0	6.17	101	
1520	7.89	19540	↓	↓	6.1	6.49	10.98	0	0	5.99	100	END PURGE
			END	SAMPLING @		1553		WL=	8.19			

Water Quality Meter (S/N): YSI
Control Box Type (S/N): QED
Turbidimeter (S/N): LA MOTTE

Notes:

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / DRMO
Project No.: 7363

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: DRMO- 6MW25 GW-07
Sample Location: 6MW25
Sampled By: S. NEIL
C.O.C. No.: 011900 07
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

Date: 1-20-00 / Time: 1500 / Method: Low Flow/Bladder Pump	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ppt
	CLEAR	7.06	23.98	7.5	3.8	3.24	-132	14.45

PURGE DATA:

Date: 1-20-00	See Attached Low Flow Purge Data Sheet for Purge Data
Method: Low Flow/Bladder Pump	
Monitor Reading (ppm): —	
Well Casing Diameter & Material Type: 2 PVC	
Total Well Depth (TD): 13.60	
Static Water Level (WL): 6.90'	
One Casing Volume(gal): 1.1	
Start Purge (hrs): 1407	
End Purge (hrs): 1457	
Total Purge Time (min): 50	
Total Vol. Purged (gal): 4.9	

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES (LOW-LEVEL)	HCL / 4° C	40 ml Vial	3
TCL SEMIVOLATILES	4° C	Qt. Amber Glass	2
TCL PEST/PCBs	4° C	Qt. Amber Glass	2
TCL PAH	4° C	Qt. Amber Glass	2
TAL METALS (TOTAL)	HNO_3 / 4° C	L PE	1
~~TAL METALS (DISSOLVED)~~	~~HNO_3 / 4° C~~	~~L PE~~	~~1~~ (W)

OBSERVATIONS / NOTES:

FINAL H_2O LEVEL = 7.19 FT.
END SAMPLING @ 1518

Circle If Applicable:

MS/MSD | Duplicate ID No.:

Signature(s):

Scott W. Neil

Tetra Tech NUS, Inc. **LOW FLOW PURGE DATA SHEET** **Well No.:** 6MW25

PROJECT: NSB-NLON, DRMO
PROJECT NUMBER: 7363
SITE: DRMO
DATE: 1-20-00
WEATHER: Cloudy, windy, Low 20's.
PERSONNEL: Scott Neil

Well Screen Depth: 3.6 / 13.6 ft.
Initial Water Level: 6.90 @ 1407 hrs.
Pump Type/Material: BLADDER/PVC
Pump Intake Depth: 10.0 TPVC
Tide Cycle: ☐ High @ ☒ Low @ 1520 ☐ Not Affected
Total Purge Volume= 4.9 (gal)/ L) **Total Purge Time=** 50 (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	Eh mV	Comments
1407	6.90	—	—	30R/30D 15PSI	—	—	—	—	—	—	→	BEGIN PURGING
1412	6.96	355	355		7.4	7.20	23.73	4.05	10.3	14.29	-147	SUSPENDED BLK
1417	6.96				7.5	7.14	23.87	3.30	3.6	14.38	-146	FINES.
1422	6.98				7.4	7.10	23.93	3.49	5.6	14.42	-145	
1427	7.02				7.4	7.11	23.92	2.94	5.1	14.44	-143	
1432	7.04				7.5	7.10	23.96	3.21	5.1	14.44	-141	
1437	7.05				7.5	7.09	23.97	3.21	3.9	14.44	-139	
1442	7.06				7.5	7.08	23.99	3.19	3.8	14.46	-137	
1447	7.08				7.5	7.08	23.99	3.45	3.4	14.48	-135	
1452	7.10				7.4	7.08	24.02	3.26	4.2	14.47	-133	
1457	7.11	↓	↓	↓	7.5	7.06	23.98	3.24	3.8	14.45	-132	END PURGING
	BEGIN SAMPLING @ 1500. Sample # DRMO-6MW25-GW-07.											
	END SAMPLING @ 1518.											

Water Quality Meter (S/N): YSI (1939332)
Control Box Type (S/N): QED (15800)
Turbidimeter (S/N): HANNA (0639-1298)
Notes:

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / DRMO
Project No.: 7363

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: DRMO- 6MW/2D GW-07
Sample Location: 6MW 2D
Sampled By: K. SIMPSON
C.O.C. No.: 011900-07
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

Date: 1-20-00 / Time: 1510 / Method:Low Flow/Bladder Pump	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ppt
	CLEAR	6.90	33.75	9.8	8.3	0	-308	21.17

PURGE DATA:

Date: 1-20-00	See Attached Low Flow Purge Data Sheet for Purge Data
Method:Low Flow/Bladder Pump	
Monitor Reading (ppm): 0	
Well Casing Diameter & Material Type: 2 PVC	
Total Well Depth (TD): 78.3	
Static Water Level (WL): 5.61	
One Casing Volume(gal): 11.9	
Start Purge (hrs): 1411	
End Purge (hrs): 1507	
Total Purge Time (min): 56	
Total Vol. Purged (gal): 4.5	

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES (LOW-LEVEL)	HCL / 4° C	40 ml Vial	3
TCL SEMIVOLATILES	4° C	Qt. Amber Glass	2
TCL PEST/PCBs	4° C	Qt. Amber Glass	2
TCL PAH	4° C	Qt. Amber Glass	2
TAL METALS (TOTAL)	HNO_3 / 4° C	L PE	1
~~TAL METALS (DISSOLVED)~~ KES	~~HNO_3 / 4° C~~	~~L PE~~	—

OBSERVATIONS / NOTES:

DISCHARGE LINE FILL. USED WARM WATER TO THAW; ON TOP 3' OF TUBING OUT OF WELL

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): K. Simpson

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

Well No.: 6MW2D

PROJECT: NSB-NLON, DRMO
PROJECT NUMBER: 7363
SITE: DRMO

DATE: 1-20-00
WEATHER: COLD/WINDY 20°F OVERCAST
PERSONNEL: R. SIMPSON

Well Screen Depth: 68.8 / 78.8 ft.
Initial Water Level: 5.61 @ 1400 hrs.
Pump Type/Material: BLADDER/PVC
Pump Intake Depth: 73.0 TAC
Tide Cycle: ☐ High @ ____ ☒ Low @ 1520 ☐ Not Affected
Total Purge Volume= ~~5.61~~ 4.5 (gal) / L
Total Purge Time= 56 (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	Eh mV	Comments
1415	6.13	0	270	40/40	9.6	6.88	33.49	0	16	20.84	-203	
1425	6.15	↓	305	50 PSI	9.6	6.82	32.94	0	12	20.71	-250	
1430	6.20		↓	35R/35D	9.5	6.82	33.41	0	10	20.77	-270	
1440	6.28			50 PSI	9.8	6.87	33.62	0	8.6	21.27	-301	
1445	6.14			↓	9.6	6.88	34.19	0	8.5	21.34	-306	
1450	6.03				9.7	6.88	33.67	0	8.5	21.00	-309	
1455	6.18				9.8	6.90	34.00	0	8.4	21.37	-307	
1500	6.14	↓			9.8	6.90	33.81	0	8.3	21.29	-307	
1505	6.10	1780	↓	↓	9.8	6.90	33.75	0	8.3	21.17	-308	END PURGE

Water Quality Meter (S/N): YSI
Control Box Type (S/N): QED
Turbidimeter (S/N): LA MOTTE

Notes:

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / DRMO
Project No.: 7363

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: DRMO- 6MW65 GW-07
Sample Location: 6MW65
Sampled By: S. Neil
C.O.C. No.: 011800.07
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

Date: 1-18-00 / Time: 0905 / Method: Low Flow/Bladder Pump	Color Visual	pH Standard (6.10)	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ppt
	CLEAR	9.15 (SW)	0.252	9.6	0.3	7.23	242	0.12

PURGE DATA:

Date: 1-18-00
Method: Low Flow/Bladder Pump
Monitor Reading (ppm): 0.0
Well Casing Diameter & Material
Type: 2 PVC
Total Well Depth (TD): 18.58
Static Water Level (WL): 9.75
One Casing Volume(gal): 1.4
Start Purge (hrs): 0807
End Purge (hrs): 0902
Total Purge Time (min): 55
Total Vol. Purged (gal): 3.4

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements		Collected
TCL VOLATILES (LOW-LEVEL)	HCL / 4° C	(3)	40 ml Vial	✓
TCL SEMIVOLATILES	4° C	(2)	Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	(2)	Qt. Amber Glass	✓
TCL PAH	4° C	(2)	Qt. Amber Glass	✓
TAL METALS (TOTAL)	HNO_3 / 4° C	(1)	L PE	✓
~~TAL METALS (DISSOLVED)~~	~~HNO_3 / 4° C~~		~~L PE~~	✓ (SW)

OBSERVATIONS / NOTES:

Circle if Applicable:
MS/MSD
Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc. **LOW FLOW PURGE DATA SHEET** **Well No.:** 6MW65

PROJECT: NSB-NLON, DRMO
PROJECT NUMBER: 7363
SITE: DRMO

DATE: 1-18-00
WEATHER: Breezy, Clear, cold, 3-7°F
PERSONNEL: Scott Neil

Well Screen Depth: 8.6 / 18.6 ft.
Initial Water Level: 9.75 @ 0807 hrs.

Pump Type/Material: BLADDER/ PVC
Pump Intake Depth: 14.0 TOC

Tide Cycle: ☐ High @ ____ ☐ Low @ ____ ☒ Not Affected

Total Purge Volume= 3.4 (ga) / L) **Total Purge Time=** 55 (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	Eh mV	Comments
0807	9.75	—	—	215/45D							→	BEGIN PURGING
0812	9.73	350	233		9.6	6.18	0.253	6.97	6.6	0.12	234	1145
0817	9.71				9.6	6.18	0.253	7.62	4.0	0.12	234	2330
0822	9.71				9.7	6.10	0.253	7.68	3.0	0.12	236	3445
0827	9.71				9.6	6.12	0.252	7.60	1.8	0.12	236	4660
0832	9.71				9.4	6.07	0.254	7.30	1.4	0.12	242	
0837	9.70				9.7	6.13	0.252	7.40	1.2	0.12	239	
0842	9.70				9.7	6.12	0.253	6.90	0.8	0.12	239	
0847	9.70				9.6	6.11	0.252	7.37	0.6	0.12	240	
0852	9.69				9.6	6.12	0.253	6.91	0.5	0.12	241	
0857	9.69				9.6	6.11	0.252	7.18	0.3	0.12	242	
0902	9.69	↓	↓	↓	9.6	6.10	0.252	7.23	0.3	0.12	242	End purging
		Begin sampling @ 0905 - Sample # DRMO-6MW65-GW-07										
		End ~~sampling~~ sampling @ 0935.										
		(SW)										

Water Quality Meter (S/N): YSI
Control Box Type (S/N): QED
Turbidimeter (S/N): LaMOTTE (0639-1298)

Notes: ____

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / DRMO
Project No.: 7363

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: DRMO- 6MW6D GW-07
Sample Location: 6MW6D
Sampled By: KES
C.O.C. No.: 011800-07
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

Date: 1-15-00 / Time: 0915 / Method: Low Flow/Bladder Pump	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ppt
	CLEAR	5.95	3.732	8.9	19	1.33	89	1.97

PURGE DATA:

Date: 1-15-00
Method: Low Flow/Bladder Pump
Monitor Reading (ppm): 0
Well Casing Diameter & Material
Type: 6" ~~PVC~~ KS OPEN BORE HOLE
Total Well Depth (TD): 46.0'
Static Water Level (WL): 9.04
One Casing Volume(gal): 54.3
Start Purge (hrs): 0912
End Purge (hrs): 0912
Total Purge Time (min): 60
Total Vol. Purged (gal): 4.8

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES (LOW-LEVEL)	HCL / 4° C	40 ml Vial	✓
TCL SEMIVOLATILES	4° C	Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	Qt. Amber Glass	✓
TCL PAH	4° C	Qt. Amber Glass	✓
TAL METALS (TOTAL)	HNO_3 / 4° C	L PE	✓
~~TAL METALS (DISSOLVED)~~ KS	~~HNO_3 / 4° C~~	~~L PE~~	—

OBSERVATIONS / NOTES:

6" WELL; OPEN BORE HOLE

1.47 GAL/FT

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc. **LOW FLOW PURGE DATA SHEET** **Well No.:** GMW 6D

PROJECT: NSB-NLON, DRMO
PROJECT NUMBER: 7363
SITE: DRMO
DATE: 1-19-00
WEATHER: COLD, CLEAR -3°F
PERSONNEL:

Well Screen Depth: 30.5 / 46.0 ft.
Initial Water Level: 9.04 @ 0805 hrs.
Pump Type/Material: BLADDER/PVC
Pump Intake Depth:
Tide Cycle: ☐ High @ ☐ Low @ ☒ Not Affected
Total Purge Volume= 4.8 (gal)/(L) **Total Purge Time=** 60 (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	Eh mV	Comments
0815	9.09	0	360	20 R/R 25 PSI	8.2	6.28	3.729	1.01	85	1.99	130.1	
0820	9.06		300		8.5	5.95	3.736	1.10	60	2.00	106	
0825	9.04				8.5	5.97	3.750	9.67	45	2.00	100	
0835	9.04				8.5	5.97	3.763	7.40	45	2.00	97	
0840	9.03				8.6	5.95	3.772	3.31	45	1.99	95	
0845	9.04				9.0	5.96	3.774	2.43	45	1.99	94	
0850	9.04				8.9	5.96	3.752	1.01	45	1.97	94	
0855	9.04				9.1	5.96	3.731	1.80	39	1.99	92	
0900	9.04				9.0	5.96	3.720	1.57	39	1.99	91	
0905	9.04	↓			8.9	5.95	3.731	1.44	23	1.98	90	
0910	9.04	18,000	↓	↓	8.9	5.95	3.732	1.33	19	1.97	89	END PURGE

Water Quality Meter (S/N): YSI
Control Box Type (S/N): QED
Turbidimeter (S/N): LA MOTTE

Notes: COLD

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / DRMO
Project No.: 7363

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: DRMO- 6MW95 GW-07
Sample Location: 6MW95
Sampled By: K. SIMPSON
C.O.C. No.: 011900
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

Date: 1-19-00	Color	pH	S.C.	Temp.	Turbidity	DO	Eh	Salinity
Time: 0940	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	mV	ppt
Method: Low Flow/Bladder Pump	CLEAR	5.10	0.049	9.6	0.2	0.63	292	0.02

PURGE DATA:

Date: 1-19-00
Method: Low Flow/Bladder Pump
Monitor Reading (ppm):
Well Casing Diameter & Material
Type: 2 PVC
Total Well Depth (TD): 11.8
Static Water Level (WL): 3.58
One Casing Volume(gal): 1.4
Start Purge (hrs): 0945
End Purge (hrs): 0935
Total Purge Time (min): 50
Total Vol. Purged (gal): 4.3

0745

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES (LOW-LEVEL)	HCL / 4° C	40 ml Vial	6
TCL SEMIVOLATILES	4° C	Qt. Amber Glass	4
TCL PEST/PCBs	4° C	Qt. Amber Glass	4
TCL PAH	4° C	Qt. Amber Glass	4
TAL METALS (TOTAL)	HNO_3 / 4° C	L PE	2
~~TAL METALS (DISSOLVED)~~ KES	~~HNO_3 / 4° C~~	~~L PE~~	—
		2X VOL COLLECTED FOR DUP	

OBSERVATIONS / NOTES:

COLD 10° F

Circle if Applicable:

MS/MSD —

Duplicate ID No.: GWFD-011900

Signature(s): K. Simpson

Tetra Tech NUS, Inc. **LOW FLOW PURGE DATA SHEET** **Well No.:** GMW95

PROJECT: NSB-NLON, DRMO
PROJECT NUMBER: 7363
SITE: DRMO

DATE: 1-19-00
WEATHER: 7°F CLEAR
PERSONNEL: R. SIMPSON

Well Screen Depth: 7.8 / 11.8 ft.
Initial Water Level: 3.58 @ 0730 hrs.

Pump Type/Material: BLADDER/ PVC
Pump Intake Depth: 10.0' TPVC

Tide Cycle: ☐ High @ ____ ☐ Low @ ____ ☒ Not Affected

Total Purge Volume= 4.3 (gal) Lt **Total Purge Time=** ____ (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	Eh mV	Comments
0750	3.61	0	325	30R/30D 10 PSI	9.3	5.20	0.056	2.17	8.4	0.02	200	START PURGE
0755	↓	↓	↓	↓	9.4	5.11	0.051	1.92	4.0	0.02	224	
0805					9.7	5.08	0.049	1.20	1.7	0.02	249	
0810	↓				9.5	5.07	0.049	1.64	1.0	0.02	253	
0815	3.64				9.6	5.10	0.049	1.58	0.8	0.02	260	
0820	3.62				9.6	5.07	0.049	1.19	0.5	0.02	270	
0825	↓				9.6	5.10	0.049	0.83	0.4	0.02	273	
0830		↓			9.5	5.10	0.049	0.70	0.2	0.02	278	
0835	↓	16,250	↓	↓	9.6	5.10	0.049	0.63	0.2	0.02	282	END PURGE
		START SAMPLING			@	0837						
		END SAMPLING			@	0918						

Water Quality Meter (S/N): YSI
Control Box Type (S/N): QED
Turbidimeter (S/N): LA MOTTE

Notes: ____

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / DRMO
Project No.: 7363

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: DRMO- 6MW105 GW-07
Sample Location: 6MW105
Sampled By: S. Neil
C.O.C. No.: 011300-7
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Eh	Salinity
Date: 1-18-00	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	mV	ppt
Time: ~~1350~~ 1315								
Method: Low Flow/Bladder Pump	Clear	7.33	11.18	10.9	0.1	0.47	-264	6.34

PURGE DATA:

Date: 1-18-00	See Attached Low Flow Purge Data Sheet for Purge Data
Method: Low Flow/Bladder Pump	
Monitor Reading (ppm): 0.0	
Well Casing Diameter & Material	
Type: 2 PVC	
Total Well Depth (TD): 13.30 (SN)	
Static Water Level (WL): ~~9.50~~ 3.59	
One Casing Volume(gal): 1.6	
Start Purge (hrs): 1220	
End Purge (hrs): 1310	
Total Purge Time (min): 50	
Total Vol. Purged (gal): 3.6	

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES (LOW-LEVEL)	HCL / 4° C	40 ml Vial	
TCL SEMIVOLATILES	4° C	Qt. Amber Glass	
TCL PEST/PCBs	4° C	Qt. Amber Glass	
TCL PAH	4° C	Qt. Amber Glass	
TAL METALS (TOTAL)	HNO_3 / 4° C	L PE	
~~TAL METALS (DISSOLVED)~~	~~HNO_3 / 4° C~~	~~L PE~~	(SN)

OBSERVATIONS/NOTES:

Suspended solids (Black) in sample.
Sulphur odor.
Final H2O level = 4.03 Ft.

Circle if Applicable:
MS/MSD
Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc. **LOW FLOW PURGE DATA SHEET** **Well No.:** 6MW105

PROJECT: NSB-NLON, DRMO
PROJECT NUMBER: 7363
SITE: DRMO

DATE: 1-18-00
WEATHER: Sunny, clear, windy, cold, 11-16°F
PERSONNEL: SCOTT NEIL

Well Screen Depth: 3.3 / 13.3 ft.
Initial Water Level: 3.59' @ 1220 hrs.

Pump Type/Material: BLADDER/PVC
Pump Intake Depth: 9.0 T PVC

Tide Cycle: ☐ High @ ☒ Low @ ☐ Not Affected

Total Purge Volume= _____ (gal / L) **Total Purge Time=** _____ (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	Eh mV	Comments
1220	3.59	—	—	30R/30D 15PSI	—						→	BEGIN PURGING
1225	3.70	355	355	40R/40D 15 PSI	10.8	7.28	10.44	0.45	2.9	5.92	-70	SUSPENDED BLACK PARTICLES
1230	3.74	2 (SW)	266		10.8	7.32	10.47	0.41	1.5	6.00	-161	LGT SULFUR ODOR
1235	3.75				10.8	7.35	10.57	0.52	1.9	6.00	-187	
1240	3.77				10.8	7.35	10.76	0.48	0.8	6.11	-208	
1245	3.77				10.8	7.35	10.77	0.58	0.6	6.12	-221	
1250	3.78				10.8	7.35	10.88	0.65	0.4	6.16	-231	
1255	3.79				10.8	7.34	10.96	0.41	0.5	6.22	-239	
1300	3.79				10.8	7.34	11.10	0.43	0.3	6.25	-248	
1305	3.79				10.9	7.33	11.14	0.45	0.3	6.29	-257	
1310	3.81	↓	↓	↓	10.9	7.33	11.18	0.47	0.1	6.34	-264	END PURGING
		Begin sampling @ 1315 - Sample ID DRMO - 6MW105 - GW-07.										
		End sampling @ 1350.										

Water Quality Meter (S/N): YSI (193933R)
Control Box Type (S/N): QED
Turbidimeter (S/N): LA MOTTE (0639-1298)

Notes: _____

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / DRMO
Project No.: 7363

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: DRMO- 6MW10D GW-07
Sample Location: 6MW10D
Sampled By: RES
C.O.C. No.: 011800-07
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

Date: 1-18-00 / Time: 1315 / Method: Low Flow/Bladder Pump	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ppt
	CLEAR	7.25	18.42	12.4	0.6	3.31	-142	11.22

PURGE DATA:

Date: 1-18-00
Method: Low Flow/Bladder Pump
Monitor Reading (ppm):
Well Casing Diameter & Material Type: 2 PVC
Total Well Depth (TD): 54.10
Static Water Level (WL): 2.53
One Casing Volume(gal): 8.4
Start Purge (hrs): 1210
End Purge (hrs): 1310
Total Purge Time (min): 60
Total Vol. Purged (gal): 4.8

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES (LOW-LEVEL)	HCL / 4° C	40 ml Vial	9
TCL SEMIVOLATILES	4° C	Qt. Amber Glass	6
TCL PEST/PCBs	4° C	Qt. Amber Glass	6
TCL PAH	4° C	Qt. Amber Glass	6
TAL METALS (TOTAL)	HNO_3 / 4° C	L PE	3
~~TAL METALS (DISSOLVED)~~ KS	~~HNO_3 / 4° C~~	~~L PE~~	—
		3X VOL COLLECTED FOR MS/MSD	

OBSERVATIONS/NOTES:

FLUSH MT.

Circle if Applicable: MS/MSD YES
Duplicate ID No.: —

Signature(s): K. S. Lumpi

Tetra Tech NUS, Inc. **LOW FLOW PURGE DATA SHEET** **Well No.:** GMW 10D

PROJECT:	NSB-NLON, DRMO	**DATE:**	1-18-00
PROJECT NUMBER:	7363	**WEATHER:**	COLD 10°F CLEAR
SITE:	DRMO	**PERSONNEL:**	K. SIMPSON

Well Screen Depth: 44.1 / 54.1 ft. **Pump Type/Material:** BLADDER/PVC
Initial Water Level: 2.53 @ 1207 hrs. **Pump Intake Depth:** 49.0' TPVC
Total Purge Volume= 4.8 (gal) (L) **Total Purge Time=** 60 (min)
Tide Cycle: ☐ High @ ☒ Low @ 1338 ☐ Not Affected

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	Eh mV	Comments
1220	2.48	0	325	30D/30R 30 PSI	11.9	7.29	19.02	8.31	1.0	11.27	-93	START PURGE
1225	2.49	↓	↓	↓	12.1	7.24	19.08	11.06	1.6	11.28	-119	
1230	2.50				12.2	7.24	18.84	10.61	2.2	11.18	-155	
1240	2.52				12.3	7.25	18.72	11.24	0.9	10.98	-151	
1245	2.53				12.3	7.25	19.05	6.04	1.0	10.94	-145	
1255	2.54				12.4	7.24	18.90	4.51	1.1	11.17	-143	
1300	2.55				12.3	7.24	18.31	3.37	1.0	11.08	-141	
1305	2.57	↓			12.4	7.25	18.59	3.07	0.8	11.31	-139	
1310	2.57	18,000	↓	↓	12.4	7.25	18.42	3.31	0.6	11.22	-142	END PURGE
	START SAMPLING @				1314							
	END SAMPLING @				1415							

Water Quality Meter (S/N): YSI
Control Box Type (S/N): QED
Turbidimeter (S/N): LA MOTTE

Notes: MS/MSD COLLECTED

GROUNDWATER SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

Project Site Name: NSB-NLON / DRMO
Project No.: 7363

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: DRMO- 6MW11S GW-07
Sample Location: 6MW11S
Sampled By: KEITH SIMPSON
C.O.C. No.: 011900-07
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Eh	Salinity
	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	mV	ppt
Date: 1-19-00								
Time: 1415								
Method: Low Flow/Bladder Pump	CLEAR	7.49	12.31	9.9	1.6	5.77	-326	7.06

PURGE DATA:

Date: 1-19-00
Method: Low Flow/Bladder Pump
Monitor Reading (ppm):
Well Casing Diameter & Material
Type: 2 PVC
Total Well Depth (TD): 13.50
Static Water Level (WL): 3.24
One Casing Volume(gal): 1.7
Start Purge (hrs): 1320
End Purge (hrs): 1410
Total Purge Time (min): 50
Total Vol. Purged (gal): 3.2

See Attached Low Flow Purge Data Sheet
for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES (LOW-LEVEL)	HCL / 4° C	40 ml Vial	3
TCL SEMIVOLATILES	4° C	Qt. Amber Glass	2
TCL PEST/PCBs	4° C	Qt. Amber Glass	2
TCL PAH	4° C	Qt. Amber Glass	2
TAL METALS (TOTAL)	HNO_3 / 4° C	L PE	1
~~TAL METALS (DISSOLVED)~~ KES	~~HNO_3 / 4° C~~	~~L PE~~	—

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

KJ Simpson

Tetra Tech NUS, Inc. **LOW FLOW PURGE DATA SHEET** **Well No.:** GMW 115

PROJECT: NSB-NLON, DRMO
PROJECT NUMBER: 7363
SITE: DRMO
DATE: 1-19-00
WEATHER: 20°F SUNNY
PERSONNEL: K. SIMPSON

Well Screen Depth: 3.5 / 13.5 ft.
Initial Water Level: 3.24 @ 1255 hrs.
Pump Type/Material: BLADDER/PVC
Pump Intake Depth: 11.0 TVC
Tide Cycle: ☐ High @ ☒ Low @ 1429 ☐ Not Affected
Total Purge Volume= 3.2 (gal) (L) **Total Purge Time=** 50 (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	Eh mV	Comments
1325	3.63	0	240	45R/45D 20 PSI	10.2	7.49	14.77	10.21	14	8.60	-260	START PURGE
1330	3.64	↓	↓	↓	10.2	7.49	13.03	7.63	8.1	7.39	-310	
1335	3.66				10.0	7.49	12.56	7.11	4.5	7.23	-314	
1340	3.65				9.8	7.49	12.33	8.25	3.2	7.05	-314	
1350	3.74				10.0	7.48	12.27	5.65	2.1	7.04	-321	
1355	3.80				9.8	7.49	12.35	3.60	2.0	7.07	-225	
1400	3.80				10.1	7.48	12.34	7.21	2.0	7.08	-319	
1405	3.81	↓			9.9	7.49	12.33	6.47	1.8	7.08	-328	
1410	3.83	12,000	↓	↓	9.9	7.49	12.31	5.77	1.6	7.06	-326	
		START SAMPLING			@	1413						
		END SAMPLING			@							

Water Quality Meter (S/N): YSI
Control Box Type (S/N): QED
Turbidimeter (S/N): LA MOTTE

Notes:

GROUNDWATER SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

Project Site Name: NSB-NLON / DRMO
Project No.: 7363

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: DRMO- 6MW11D GW-07
Sample Location: 6MW11D
Sampled By: S. NEIL
C.O.C. No.: 011900-07
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Eh	Salinity
	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	mV	ppt
Date: 1-19-00								
Time: 1433								
Method: Low Flow/Bladder Pump	CLEAR	6.91	34.40	11.8	0.5	5.04	-235	21.61

PURGE DATA:

Date: 1-19-00
Method: Low Flow/Bladder Pump
Monitor Reading (ppm): —
Well Casing Diameter & Material
Type: 2 PVC
Total Well Depth (TD): 85.0'
Static Water Level (WL): 3.64'
One Casing Volume(gal): 13.2
Start Purge (hrs): 1330
End Purge (hrs): 1430
Total Purge Time (min): 60
Total Vol. Purged (gal): 7.6

See Attached Low Flow Purge Data Sheet
for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES (LOW-LEVEL)	HCL / 4° C	40 ml Vial	✓
TCL SEMIVOLATILES	4° C	Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	Qt. Amber Glass	✓
TCL PAH	4° C	Qt. Amber Glass	✓
TAL METALS (TOTAL)	HNO_3 / 4° C	L PE	✓
~~TAL METALS (DISSOLVED)~~	~~HNO_3 / 4° C~~	~~L PE~~	~~✓~~ (SW)

OBSERVATIONS / NOTES:

FINAL H_2O LEVEL = 4.11 FT.

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Scott W. Neil

Tetra Tech NUS, Inc. **LOW FLOW PURGE DATA SHEET** **Well No.:** GMW11D

PROJECT: NSB-NLON, DRMO
PROJECT NUMBER: 7363
SITE: DRMO

DATE: 1-19-00
WEATHER: CLEAR, WINDY, COLD, LOW 20'S.
PERSONNEL: SCOTT NEIL

Well Screen Depth: 75.0 / 85.0 ft.
Initial Water Level: 3.94 @ 1330 hrs.

Pump Type/Material: BLADDER/PVC
Pump Intake Depth: 82.0 TPVC

Tide Cycle: ☐ High @ ____ ☒ Low @ 1429 ☐ Not Affected

Total Purge Volume= 7.6 (ga)/L) **Total Purge Time=** 60 (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	Eh mV	Comments
1330	3.94	—	—	35A/35D 50 PSI							→	BEGIN PURGING.
1335	4.03	560	480		10.2	6.99	34.50	2.33	4.0	21.59	-177	
1340	4.03				10.9	6.95	34.48	1.50	2.1	21.57	-181	
1345	4.04				11.0	6.94	34.49	2.32	0.9	21.65	-192	
1350	4.06				11.5	6.94	34.50	2.71	0.8	21.66	-208	
1355	4.06				11.6	6.93	34.51	4.21	0.6	21.66	-221	
1400	4.07				11.4	6.93	34.55	4.28	0.7	21.69	-219	
1405	4.07				11.5	6.93	34.53	4.50	0.6	21.71	-220	
1410	4.09				11.4	6.90	34.54	4.77	0.7	21.74	-224	
1415	4.10				11.6	6.92	34.52	4.68	0.6	21.68	-228	
1420	4.09				11.7	6.92	34.48	4.84	0.6	21.66	-232	
1425	4.10				11.7	6.91	34.42	4.89	0.3	21.63	-232	
1430	4.10	↓	↓	↓	11.8	6.91	34.40	5.04	0.5	21.61	-235	END PURGING
	BEGIN SAMPLING @ 1433; SAMPLE ID # DRMO-GMW11D-GW-07.											
	END SAMPLING @ 1454.											

Water Quality Meter (S/N): YSI (193933R)
Control Box Type (S/N): QED (15800)
Turbidimeter (S/N): LA MOTTE (0639-1298)

Notes: Attempted to begin purging at 1315, however the tubing inside the well casing was frozen. "Unclogged" ice in tubing and began purging @ 1330.

APPENDIX F

CHAIN-OF-CUSTODY RECORDS

TETRA TECH NUS, INC.

DRMO CTO 267

CHAIN OF CUSTODY | NUMBER 011800-07 | PAGE 1 OF 1

PROJECT NO: 7363	SITE NAME: NSB - NIUN
PROJECT MANAGER AND PHONE NUMBER	MARK MENGEL 412 921 8123
FIELD OPERATIONS LEADER AND PHONE NUMBER	KEITH SIMPSON 412 921 8131
CARRIER/WAYBILL NUMBER	ACCUTEST PICK-UP
LABORATORY NAME AND CONTACT:	ACCUTEST
ADDRESS	2235 ROUTE 130
CITY, STATE	DAYTON NJ 08810
SAMPLERS (SIGNATURE)	K-1 S. Simpson

STANDARD TAT ☒
RUSH TAT ☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2000	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)								
						G	G	G	G	P				
						PRESERVATIVE USED								
		TYPE OF ANALYSIS				TCL VOC 40 mL VIAL	TCL SVOC (L)	TCL PAH (L)	TCL PEST/PCB (L)	TOTAL TAL METALS (L) HNO3				COMMENTS
1/18	0710	GWTB-011800	AQ	G	2	2								TRIP BLANK
	0905	DRMO-GMW65-GW-07	GW	G	10	3	2	2	2	1				
	0915	DRMO-GMW60 GW 07	GW	G	10	3	2	2	2	1				
	1315	DRMO-GMW10D GW07	GW	G	30	9	6	6	6	3				RUN ALSO MS/MSD
↓	~~1350~~ 1315	DRMO-GMW10S GW07	GW	G	10	3	2	2	2	1				

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY K-1 S. Simpson	1.19.00	0810	1. RECEIVED BY	1/19/00	0810
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

YELLOW (FIELD COPY) PINK (FILE COPY) 3/99

TETRA TECH NUS, INC.

DRMO SITE 267

CHAIN OF CUSTODY | NUMBER 011900-07 | PAGE 1 OF 1

PROJECT NO: 7363	SITE NAME: NSB-NORK	PROJECT MANAGER AND PHONE NUMBER: MARK MCNOLL 4129218723	LABORATORY NAME AND CONTACT: ACCUTEST
SAMPLERS (SIGNATURE): K. Simpson		FIELD OPERATIONS LEADER AND PHONE NUMBER: KEITH SIMPSON 4129219131	ADDRESS: 2235 ROUTE 130
		CARRIER/WAYBILL NUMBER: ACCUTEST PICK-UP	CITY, STATE: DAYTON, NJ 08810

STANDARD TAT ☒
RUSH TAT ☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE (YEAR 2000)	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	G	G	G	G	P					
						PRESERVATIVE USED		HCl								
						TYPE OF ANALYSIS	TCL VOC 40 ML VIAL	TCL SVOC (L)	TCL PAH (L)	TCL PEST/PCB (L)	TOTAL TAL METALS (L)	HNO3				COMMENTS
1/19	0715	GWTB-011900	AQ	G	2	2										TRIP BLANK
	0000	GWFD-011900	GW	G	10	3	2	2	2	1						GMW9S DUP
	0840	DRMO GMW9S GW 07	GW	G	10	3	2	2	2	1						
	1415	DRMO GMW11S GW 07	GW	G	10	3	2	2	2	1						
↓	1433	DRMO GMW11D GW 07	GW	G	10	3	2	2	2	1						
1/20	1500	DRMO GMW2S GW07	GW	G	10	3	2	2	2	1						
↓	1510	DRMO GMW2D GW07	GW	G	10	3	2	2	2	1						

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY: K. Simpson	1.21.00	0745	1. RECEIVED BY:		
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	1/21/00	0745
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD FILE)

DRMO

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER 012100-07 | PAGE 1 OF 1

PROJECT NO: 7363	SITE NAME: NSB-NIUN	PROJECT MANAGER AND PHONE NUMBER: MARK MINGEL 412 921 8723	LABORATORY NAME AND CONTACT: ACCUTEST
SAMPLERS (SIGNATURE): R. J. Simpson		FIELD OPERATIONS LEADER AND PHONE NUMBER: KEITH SIMPSON 412 921 8131	ADDRESS: 2235 ROUTE 130
		CARRIER/WAYBILL NUMBER: ACCUTEST PICK-UP	CITY, STATE: DAYTON, NJ 08810

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE (YEAR 2000)	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)									
						PRESERVATIVE USED	HCL	—	—	—	HNO3				
						TYPE OF ANALYSIS	TCL VOC 40 ML VIAL	TCL SVOC (L)	TCL PAH (L)	TCL PEST/PCB (L)	TOTAL TAL METALS (L)				COMMENTS
1/21	0700	GWTB-012100	AQ	G	2										TRIP BLANK
↓	1525	DRMO GMW15 GW07	GW	G	10		3	2	2	2	1				

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY: R. J. Simpson	1.24.00	0715	1. RECEIVED BY: [signature]	1/24/00	0715
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

YELLOW (FIELD COPY) PINK (FILE COPY) 3/99

APPENDIX G

DATA VALIDATION LETTERS AND LABORATORY DATA SHEETS

TETRA TECH NUS, INC.

INTERNAL CORRESPONDENCE

EPC-00-014

TO: MARK MENGEL **DATE: MARCH 29, 2000**

FROM: KATHY A. LANDKROHN **COPIES: DV FILE**

SUBJECT: ORGANIC DATA VALIDATION: VOA/PEST/PCB
CTO 267, NSB NEW LONDON
SDG E62315

SAMPLES: 13/Aqueous/

DRMO-6MW10D-GW-07	DRMO-6MW10S-GW-07	DRMO-6MW11D-GW-07
DRMO-6MW11S-GW-07	DRMO-6MW2D-GW-07	DRMO-6MW2S-GW-07
DRMO-6MW6D-GW-07	DRMO-6MW6S-GW-07	DRMO-6MW9S-GW-07
GWFD-011900	GWTB-011800	GWTB-011900

Overview

The sample set for the CTO 267, NSB New London, SDG E62315 consists of ten (10) aqueous environmental samples and two (2) trip blanks. Environmental samples were analyzed for volatile organic compounds and pesticides/polychlorinated biphenyls (PCBs). The trip blanks, designated GWTB, were analyzed for volatile organic compounds only. One field duplicate pair was included in the SDG: DRMO-6MW9S-GW-07 and GWFD-011900. The field crew designated sample DRMO-6MW10D-GW-07 for Matrix Spike/Matrix Spike Duplicate (MS/MSD) analysis.

The samples were collected by TetraTech NUS on January 18, 19, and 20, 2000 and analyzed by Accutest Laboratories. Analyses were conducted using the Contract Laboratory Program (CLP) Statement of Work (SOW) OLC02.1 analytical and reporting protocols.

The data were evaluated based on the following parameters:

*	• Data Completeness
*	• Holding Times
*	• GC/MS Tuning
	• Calibration
*	• Blanks
	• Surrogate Spike Recoveries
*	• Field Duplicate Precision
*	• Internal Standards Performance
*	• Instrument Performance
*	• Compound Identification
*	• Compound Quantitation
*	• Tentatively Identified Compounds (TICs)

The asterisk (*) indicates that all quality control criteria were met for this parameter. Qualified (if applicable) analytical results are summarized in Appendix A. Results as reported by the laboratory are presented in Appendix B. Appendix C contains Region I worksheets, and Appendix D contains the documentation to support the findings as discussed in this data validation report.

CALIBRATIONS

The following tables summarize calibration non-compliances and corresponding actions:

Compound	IC 01/26/00	CC 01/27/00
Bromomethane		X

Associated Samples: GWTB-011900

Calibration Actions:

D - Percent Relative Standard Deviation > 30%, Estimated (UJ) nondetected results.
X - Percent Difference > 25%; Estimate (J) positive and (UJ) nondetected results.
R - Relative Response Factors < 0.05; Reject (R) nondetected results and estimated, (J) positive.

SURROGATE RECOVERY

Surrogate recoveries of decachlorobiphenyl were reported above the upper quality control limit on one column in the pesticide/PCB fraction for samples GWFD-01190, DRMO-6MW9S-GW-07, DRMO-6MW11S-GW-07, DRMO-6MW11D-GW-07, DRMO-6MW6S-GW-07, and DRMO-6MW6D-GW-07. Surrogate recoveries reported for the second column of these same samples were reported within the quality control limit. Nondetected results were not qualified as a result of this noncompliance.

BLANK SPIKE RECOVERIES

The percent recovery (%R) of the Blank Spike analyzed on 02/04/2000 was less than the lower quality control limit for Endosulfan sulfate. Nondetected results for samples DRMO-6MW10D-GW-07, DRMO-6MW10S-GW-07, DRMO-6MW6D-GW-07, and DRMO-6MW6S-GW-07 were qualified as estimated, UJ.

ADDITIONAL COMMENTS

Positive results reported at concentrations below the CRQL were qualified as estimated, J.

The presence of methylene chloride in samples DRMO-6MW2S-GW-07 and DRMO-6MW6D-GW-07 is considered to be a laboratory contaminant by the data reviewer. The concentration in both samples is below the CRQL and no action was taken.

The %R of the Blank Spike analyzed on 02/07/2000 was greater than the upper quality control limit for Endrin. No action was taken based on this noncompliance.

The text of this report has been formulated to address only those problem areas affecting data quality.

OVERALL ASSESSMENT

Laboratory Performance: The laboratory was unable to obtain acceptable percent differences between initial and continuing calibration response factors for one volatile compound. Surrogate recoveries for six samples in the pesticide/PCB fraction was above the upper quality control limit. Blank spike recoveries for one pesticide compound were below the quality control limit for four samples.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the Region I EPA "Volatile and Semivolatile Data Validation Functional Guidelines - Part II" (12/96).

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

TetraTech NUS
Kathy A. Landkrohn
Environmental Scientist

TetraTech NUS
Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C - Regional Worksheets
4. Appendix D - Support Documentation

NSB NEW LONDON

SDG E62315

TABLE I. Summary of Tentatively Identified Volatile Compounds

TIC (DRMO-xxxxxx-GW-07)	6MW10D	6MW10S	6MW11D	6MW11S	6MW2D
Ethene, chlorotrifluoro-	X				
Ethane, 1,2-dichloro-1,1,2-trifluoro	X				
Ethane, 1,1,2-trichloro-1,2,2-trifluoro	X				

4-6-2000 JBI

TIC (DRMO-xxxxxx-GW-07)	6MW2S	6MW6D	6MW6S	6MW9S	GWFD-011900

APPENDIX A

QUALIFIED LABORATORY RESULTS

CTO267 - NSB NEW LONDON
WATER DATA
Accutest, NJ
SDG: E62315

SAMPLE NUMBER:	DRMO-6MW10D-GW-07			DRMO-6MW10S-GW-07			DRMO-6MW11D-GW-07			DRMO-6MW11S-GW-07		
SAMPLE DATE:	01/18/00			01/18/00			01/19/00			01/19/00		
LABORATORY ID:	E62315-4			E62315-5			E62315-10			E62315-9		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
1,1,1-TRICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1,2,2-TETRACHLOROETHANE	1	U		1	U		1	U		1	U	
1,1,2-TRICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1-DICHLOROETHANE	1	U		0.9	J	P	1	U		1	U	
1,1-DICHLOROETHENE	1	U		1	U		1	U		1	U	
1,2-DIBROMO-3-CHLOROPROPANE	1	U		1	U		1	U		1	U	
1,2-DIBROMOETHANE	1	U		1	U		1	U		1	U	
1,2-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,2-DICHLOROETHANE	1	U		1	U		1	U		1	U	
1,2-DICHLOROPROPANE	1	U		1	U		1	U		1	U	
1,3-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,4-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
2-BUTANONE	5	U		5	U		5	U		5	U	
2-HEXANONE	5	U		5	U		5	U		5	U	
4-METHYL-2-PENTANONE	5	U		5	U		5	U		5	U	
ACETONE	5	U		5	U		5	U		5	U	
BENZENE	1	U		1	U		1	U		1	U	
BROMOCHLOROMETHANE	1	U		1	U		1	U		1	U	
BROMODICHLOROMETHANE	1	U		1	U		1	U		1	U	
BROMOFORM	1	U		1	U		1	U		1	U	
BROMOMETHANE	1	U		1	U		1	U		1	U	
CARBON DISULFIDE	1	U		1	U		1	U		1	U	
CARBON TETRACHLORIDE	1	U		1	U		1	U		1	U	
CHLOROBENZENE	1	U		1	U		1	U		1	U	
CHLOROETHANE	1	U		1	U		1	U		1	U	
CHLOROFORM	1	U		1	U		1	U		1	U	
CHLOROMETHANE	1	U		1	U		1	U		1	U	
CIS-1,2-DICHLOROETHENE	15			0.9	J	P	1	U		1	U	
CIS-1,3-DICHLOROPROPENE	1	U		1	U		1	U		1	U	
DIBROMOCHLOROMETHANE	1	U		1	U		1	U		1	U	
ETHYLBENZENE	1	U		1	U		1	U		1	U	
METHYLENE CHLORIDE	2	U		2	U		2	U		2	U	
STYRENE	1	U		1	U		1	U		1	U	
TETRACHLOROETHENE							1	U			U	

CTO267 - NSB NEW LONDON
WATER DATA
Accutest, NJ
SDG: E62315

SAMPLE NUMBER:	DRMO-6MW10D-GW-07			DRMO-6MW10S-GW-07			DRMO-6MW11D-GW-07			DRMO-6MW11S-GW-07		
SAMPLE DATE:	01/18/00			01/18/00			01/19/00			01/19/00		
LABORATORY ID:	E62315-4			E62315-5			E62315-10			E62315-9		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	**QUAL**	**CODE**	**RESULT**	**QUAL**	**CODE**	**RESULT**	**QUAL**	**CODE**	**RESULT**	**QUAL**	**CODE**
VOLATILES												
TOLUENE	1	U		1	U		1	U		1	U	
TRANS-1,2-DICHLOROETHENE	1	U		1	U		1	U		1	U	
TRANS-1,3-DICHLOROPROPENE	1	U		1	U		1	U		1	U	
TRICHLOROETHENE	5			1	U		1	U		1	U	
VINYL CHLORIDE	1	U		1	U		1	U		1	U	
XYLENES, TOTAL	1	U		1	U		1	U		1	U	

CTO267 - NSB NEW LONDON
WATER DATA
Accutest, NJ
SDG: E62315

SAMPLE NUMBER:	DRMO-6MW2D-GW-07			DRMO-6MW2S-GW-07			DRMO-6MW6D-GW-07			DRMO-6MW6S-GW-07		
SAMPLE DATE:	01/20/00			01/20/00			01/18/00			01/18/00		
LABORATORY ID:	E62315-12			E62315-11			E62315-3			E62315-2		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
1,1,1-TRICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1,2,2-TETRACHLOROETHANE	1	U		1	U		1	U		1	U	
1,1,2-TRICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1-DICHLOROETHANE	0.6	J	P	1	U		1	U		1	U	
1,1-DICHLOROETHENE	1	U		1	U		1	U		1	U	
1,2-DIBROMO-3-CHLOROPROPANE	1	U		1	U		1	U		1	U	
1,2-DIBROMOETHANE	1	U		1	U		1	U		1	U	
1,2-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,2-DICHLOROETHANE	1	U		1	U		1	U		1	U	
1,2-DICHLOROPROPANE	1	U		1	U		1	U		1	U	
1,3-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,4-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
2-BUTANONE	5	U		5	U		5	U		5	U	
2-HEXANONE	5	U		5	U		5	U		5	U	
4-METHYL-2-PENTANONE	5	U		5	U		5	U		5	U	
ACETONE	5	U		5	U		5	U		5	U	
BENZENE	1	U		1	U		1	U		1	U	
BROMOCHLOROMETHANE	1	U		1	U		1	U		1	U	
BROMODICHLOROMETHANE	1	U		1	U		1	U		1	U	
BROMOFORM	1	U		1	U		1	U		1	U	
BROMOMETHANE	1	U		1	U		1	U		1	U	
CARBON DISULFIDE	1	U		1	U		1	U		1	U	
CARBON TETRACHLORIDE	1	U		1	U		1	U		1	U	
CHLOROBENZENE	1	U		1	U		1	U		1	U	
CHLOROETHANE	1	U		1	U		1	U		1	U	
CHLOROFORM	1	U		1	U		1	U		1	U	
CHLOROMETHANE	1	U		1	U		1	U		1	U	
CIS-1,2-DICHLOROETHENE	0.9	J	P	1	U		5			1	U	
CIS-1,3-DICHLOROPROPENE	1	U		1	U		1	U		1	U	
DIBROMOCHLOROMETHANE	1	U		1	U		1	U		1	U	
ETHYLBENZENE	1	U		1	U		1	U		1	U	
METHYLENE CHLORIDE	2	U		0.7	J	P	1	J	P	2	U	
STYRENE	1	U		1	U		1	U		1	U	
TETRACHLOROETHENE							1	U		1	U	

CTO267 - NSB NEW LONDON
WATER DATA
Accutest, NJ
SDG: E62315

SAMPLE NUMBER:	DRMO-6MW2D-GW-07			DRMO-6MW2S-GW-07			DRMO-6MW6D-GW-07			DRMO-6MW6S-GW-07		
SAMPLE DATE:	01/20/00			01/20/00			01/18/00			01/18/00		
LABORATORY ID:	E62315-12			E62315-11			E62315-3			E62315-2		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	**QUAL**	**CODE**	**RESULT**	**QUAL**	**CODE**	**RESULT**	**QUAL**	**CODE**	**RESULT**	**QUAL**	**CODE**
VOLATILES												
TOLUENE	1	U		1	U		1	U		1	U	
TRANS-1,2-DICHLOROETHENE	1	U		1	U		1	U		1	U	
TRANS-1,3-DICHLOROPROPENE	1	U		1	U		1	U		1	U	
TRICHLOROETHENE	1	U		1	U		9			0.5	J	P
VINYL CHLORIDE	0.8	J	P	1	U		1	U		1	U	
XYLENES, TOTAL	1	U		1	U		1	U		1	U	

CTO267 - NSB NEW LONDON
WATER DATA
Accutest, NJ
SDG: E62315

SAMPLE NUMBER:	DRMO-6MW9S-GW-07	GWFD-011900	GWTB-011800	GWTB-011900
SAMPLE DATE:	01/19/00	01/19/00	01/18/00	01/19/00
LABORATORY ID:	E62315-8	E62315-7	E62315-1	E62315-6
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:	UG/L	UG/L	UG/L	UG/L
FIELD DUPLICATE OF:		DRMO-GMW9S-GW-07		

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
1,1,1-TRICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1,2,2-TETRACHLOROETHANE	1	U		1	U		1	U		1	U	
1,1,2-TRICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1-DICHLOROETHANE	1			1	U		1	U		1	U	
1,1-DICHLOROETHENE	1	U		1	U		1	U		1	U	
1,2-DIBROMO-3-CHLOROPROPANE	1	U		1	U		1	U		1	U	
1,2-DIBROMOETHANE	1	U		1	U		1	U		1	U	
1,2-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,2-DICHLOROETHANE	1	U		1	U		1	U		1	U	
1,2-DICHLOROPROPANE	1	U		1	U		1	U		1	U	
1,3-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,4-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
2-BUTANONE	5	U		5	U		5	U		5	U	
2-HEXANONE	5	U		5	U		5	U		5	U	
4-METHYL-2-PENTANONE	5	U		5	U		5	U		5	U	
ACETONE	5	U		5	U		5	U		5	U	
BENZENE	1	U		1	U		1	U		1	U	
BROMOCHLOROMETHANE	1	U		1	U		1	U		1	U	
BROMODICHLOROMETHANE	1	U		1	U		1	U		1	U	
BROMOFORM	1	U		1	U		1	U		1	U	
BROMOMETHANE	1	U		1	U		1	U		1	UJ	C
CARBON DISULFIDE	1	U		1	U		1	U		1	U	
CARBON TETRACHLORIDE	1	U		1	U		1	U		1	U	
CHLOROBENZENE	1	U		1	U		1	U		1	U	
CHLOROETHANE	1	U		1	U		1	U		1	U	
CHLOROFORM	1	U		1	U		1	U		1	U	
CHLOROMETHANE	1	U		1	U		1	U		1	U	
CIS-1,2-DICHLOROETHENE	1			1	U		1	U		1	U	
CIS-1,3-DICHLOROPROPENE	1	U		1	U		1	U		1	U	
DIBROMOCHLOROMETHANE	1	U		1	U		1	U		1	U	
ETHYLBENZENE	1	U		1	U		1	U		1	U	
METHYLENE CHLORIDE	2	U		2	U		2	U		2	U	
STYRENE	1	U		1	U		1	U		1	U	
TETRACHLOROETHENE							1	U			U	

CTO267 - NSB NEW LONDON
WATER DATA
Accutest, NJ
SDG: E62315

SAMPLE NUMBER:	DRMO-6MW9S-GW-07			GWFD-011900			GWTB-011800			GWTB-011900		
SAMPLE DATE:	01/19/00			01/19/00			01/18/00			01/19/00		
LABORATORY ID:	E62315-8			E62315-7			E62315-1			E62315-6		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:				DRMO-GMW9S-GW-07								
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
TOLUENE	1	U		1	U		1	U		1	U	
TRANS-1,2-DICHLOROETHENE	1	U		1	U		1	U		1	U	
TRANS-1,3-DICHLOROPROPENE	1	U		1	U		1	U		1	U	
TRICHLOROETHENE	1	U		1	U		1	U		1	U	
VINYL CHLORIDE	1	U		1	U		1	U		1	U	
XYLENES, TOTAL	1	U		1	U		1	U		1	U	

CTO267 - NSB NEW LONDON
WATER DATA
Accutest, NJ
SDG: E62315

SAMPLE NUMBER:	DRMO-6MW10D-GW-07			DRMO-6MW10S-GW-07			DRMO-6MW11D-GW-07			DRMO-6MW11S-GW-07		
SAMPLE DATE:	01/18/00			01/18/00			01/19/00			01/19/00		
LABORATORY ID:	E62315-4			E62315-5			E62315-10			E62315-9		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
4,4'-DDD	0.02	U		0.02	U		0.02	U		0.02	U	
4,4'-DDE	0.02	U		0.02	U		0.02	U		0.02	U	
4,4'-DDT	0.02	U		0.02	U		0.02	U		0.02	U	
ALDRIN	0.01	U		0.01	U		0.01	U		0.01	U	
ALPHA-BHC	0.01	U		0.01	U		0.01	U		0.01	U	
ALPHA-CHLORDANE	0.01	U		0.01	U		0.01	U		0.01	U	
AROCLOR-1016	0.2	U		0.2	U		0.2	U		0.2	U	
AROCLOR-1221	0.4	U		0.4	U		0.4	U		0.4	U	
AROCLOR-1232	0.2	U		0.2	U		0.2	U		0.2	U	
AROCLOR-1242	0.2	U		0.2	U		0.2	U		0.2	U	
AROCLOR-1248	0.2	U		0.2	U		0.2	U		0.2	U	
AROCLOR-1254	0.2	U		0.2	U		0.2	U		0.2	U	
AROCLOR-1260	0.2	U		0.2	U		0.2	U		0.2	U	
BETA-BHC	0.01	U		0.01	U		0.01	U		0.01	U	
DELTA-BHC	0.01	U		0.01	U		0.01	U		0.01	U	
DIELDRIN	0.02	U		0.02	U		0.02	U		0.02	U	
ENDOSULFAN I	0.01	U		0.01	U		0.01	U		0.01	U	
ENDOSULFAN II	0.02	U		0.02	U		0.02	U		0.02	U	
ENDOSULFAN SULFATE	0.02	UJ	E	0.02	UJ	E	0.02	U		0.02	U	
ENDRIN	0.02	U		0.02	U		0.02	U		0.02	U	
ENDRIN ALDEHYDE	0.02	U		0.02	U		0.02	U		0.02	U	
ENDRIN KETONE	0.02	U		0.02	U		0.02	U		0.02	U	
GAMMA-BHC (LINDANE)	0.01	U		0.01	U		0.01	U		0.01	U	
GAMMA-CHLORDANE	0.01	U		0.01	U		0.01	U		0.01	U	
HEPTACHLOR	0.01	U		0.01	U		0.01	U		0.01	U	
HEPTACHLOR EPOXIDE	0.01	U		0.01	U		0.01	U		0.01	U	
METHOXYCHLOR	0.1	U		0.1	U		0.1	U		0.1	U	
TOXAPHENE	1	U		1	U		1	U		1	U	

CTO267 - NSB NEW LONDON
WATER DATA
Accutest, NJ
SDG: E62315

SAMPLE NUMBER:	DRMO-6MW2D-GW-07			DRMO-6MW2S-GW-07			DRMO-6MW6D-GW-07			DRMO-6MW6S-GW-07		
SAMPLE DATE:	01/20/00			01/20/00			01/18/00			01/18/00		
LABORATORY ID:	E62315-12			E62315-11			E62315-3			E62315-2		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
4,4'-DDD	0.021	U		0.021	U		0.021	U		0.02	U	
4,4'-DDE	0.021	U		0.021	U		0.021	U		0.02	U	
4,4'-DDT	0.021	U		0.021	U		0.021	U		0.02	U	
ALDRIN	0.01	U		0.01	U		0.01	U		0.01	U	
ALPHA-BHC	0.01	U		0.01	U		0.01	U		0.01	U	
ALPHA-CHLORDANE	0.01	U		0.01	U		0.01	U		0.01	U	
AROCLOR-1016	0.21	U		0.21	U		0.21	U		0.2	U	
AROCLOR-1221	0.41	U		0.42	U		0.42	U		0.4	U	
AROCLOR-1232	0.21	U		0.21	U		0.21	U		0.2	U	
AROCLOR-1242	0.21	U		0.21	U		0.21	U		0.2	U	
AROCLOR-1248	0.21	U		0.21	U		0.21	U		0.2	U	
AROCLOR-1254	0.21	U		0.21	U		0.21	U		0.2	U	
AROCLOR-1260	0.21	U		0.21	U		0.21	U		0.2	U	
BETA-BHC	0.01	U		0.01	U		0.01	U		0.01	U	
DELTA-BHC	0.01	U		0.01	U		0.01	U		0.01	U	
DIELDRIN	0.021	U		0.021	U		0.021	U		0.02	U	
ENDOSULFAN I	0.01	U		0.01	U		0.01	U		0.01	U	
ENDOSULFAN II	0.021	U		0.021	U		0.021	U		0.02	U	
ENDOSULFAN SULFATE	0.021	U		0.021	U		0.021	UJ	E	0.02	UJ	E
ENDRIN	0.021	U		0.021	U		0.021	U		0.02	U	
ENDRIN ALDEHYDE	0.021	U		0.021	U		0.021	U		0.02	U	
ENDRIN KETONE	0.021	U		0.021	U		0.021	U		0.02	U	
GAMMA-BHC (LINDANE)	0.01	U		0.01	U		0.01	U		0.01	U	
GAMMA-CHLORDANE	0.01	U		0.01	U		0.01	U		0.01	U	
HEPTACHLOR	0.01	U		0.01	U		0.01	U		0.01	U	
HEPTACHLOR EPOXIDE	0.01	U		0.01	U		0.01	U		0.01	U	
METHOXYCHLOR	0.1	U		0.1	U		0.1	U		0.1	U	
TOXAPHENE	1	U		1	U		1	U		1	U	

CTO267 - NSB NEW LONDON
WATER DATA
Accutest, NJ
SDG: E62315

SAMPLE NUMBER:	DRMO-6MW9S-GW-07	GWFD-011900		
SAMPLE DATE:	01/19/00	01/19/00	/ /	/ /
LABORATORY ID:	E62315-8	E62315-7		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	UG/L	UG/L		
FIELD DUPLICATE OF:		DRMO-GMW9S-GW-07		

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
4,4'-DDD	0.02	U		0.021	U							
4,4'-DDE	0.02	U		0.021	U							
4,4'-DDT	0.02	U		0.021	U							
ALDRIN	0.01	U		0.01	U							
ALPHA-BHC	0.01	U		0.01	U							
ALPHA-CHLORDANE	0.01	U		0.01	U							
AROCLOR-1016	0.2	U		0.21	U							
AROCLOR-1221	0.4	U		0.42	U							
AROCLOR-1232	0.2	U		0.21	U							
AROCLOR-1242	0.2	U		0.21	U							
AROCLOR-1248	0.2	U		0.21	U							
AROCLOR-1254	0.2	U		0.21	U							
AROCLOR-1260	0.2	U		0.21	U							
BETA-BHC	0.01	U		0.01	U							
DELTA-BHC	0.01	U		0.01	U							
DIELDRIN	0.02	U		0.021	U							
ENDOSULFAN I	0.01	U		0.01	U							
ENDOSULFAN II	0.02	U		0.021	U							
ENDOSULFAN SULFATE	0.02	U		0.021	U							
ENDRIN	0.02	U		0.021	U							
ENDRIN ALDEHYDE	0.02	U		0.021	U							
ENDRIN KETONE	0.02	U		0.021	U							
GAMMA-BHC (LINDANE)	0.01	U		0.01	U							
GAMMA-CHLORDANE	0.01	U		0.01	U							
HEPTACHLOR	0.01	U		0.01	U							
HEPTACHLOR EPOXIDE	0.01	U		0.01	U							
METHOXYCHLOR	0.1	U		0.1	U							
TOXAPHENE	1	U		1	U							

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO: **MARK MENGEL** **DATE: MARCH 30, 2000**

FROM: **LINDA KARSONOVICH** **COPIES: DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION: VOA/PEST/PCB**
CTO 267, NSB NEW LONDON
SDG E62512

SAMPLES: 2/Aqueous/

DRMO-6MW1S-GW-07 GWTB-012100

Overview

The sample set for the CTO 267, NSB New London, SDG E62512 consists of one (1) aqueous environmental sample and in (1) trip blank. All samples were analyzed for volatile organic compounds. The environmental sample was also analyzed for pesticides/PCBs. No field duplicate pairs were included in the SDG.

The samples were collected by TetraTech NUS on January 21, 2000 and were analyzed by Accutest. Analyses were conducted using CLP SOW OLC02.1 analytical and reporting protocols.

The data were evaluated based on the following parameters:

* • Data Completeness
* • Holding Times
* • GC/MS Tuning
• Calibration
* • Blanks
• Surrogate Spike Recoveries
* • Internal Standards Performance
* • Instrument Performance
* • Compound Identification
* • Compound Quantitation
* • Detection Limits

The asterisk (*) indicates that all quality control criteria were met for this parameter. Qualified (if applicable) analytical results are summarized in Appendix A. Results as reported by the laboratory are presented in Appendix B. Appendix C contains Region I worksheets, and Appendix D contains the documentation to support the findings as discussed in this data validation report. The attached Table I summarizes the validation qualifications which were based on the following information:

CALIBRATIONS

The following tables summarize calibration noncompliances and corresponding actions:

Compound	IC 01/26/00	CC 01/27/00
Bromomethane		X

Associated Samples: All

Calibration Actions:
X - Percent Difference > 25%; Estimate (J) positive and (UJ) nondetected results.

SURROGATE

Surrogate recovery of decachlorobiphenyl exceeded the upper quality control limit on one analytical column in sample DRMO-6MW1S-GW-07. No qualifiers were assigned on this basis since the other was compliant and no target compounds were detected in the sample.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Matrix spike recovery of Endrin exceeded the upper quality control limit. No qualifiers were assigned on this basis.

BLANK SPIKE RESULTS

Blank spike recovery of Endrin exceeded the upper quality control limit. No qualifiers were assigned on this basis.

ADDITIONAL COMMENTS

The text of this report has been formulated to address only those problem areas affecting data quality.

OVERALL ASSESSMENT

Laboratory Performance: Bromomethane exceeded the continuing calibration %D criteria.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the Region I EPA "Volatile and Semivolatile Data Validation Functional Guidelines - Part II" (12/96).

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

TetraTech NUS

Linda Karsonovich
Chemist/Data Validator

TetraTech NUS

Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C - Regional Worksheets
4. Appendix D - Support Documentation

NEW LONDON NSB

SDG E62512

TABLE II. Summary of Tentatively Identified Volatile Compounds

TIC
No TICs were reported.

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - include ICSAB % R's
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCB D% between columns for positive results
V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = % Solid content is less than 30%

APPENDIX A

QUALIFIED LABORATORY RESULTS

CTO267 -NSB NEW LONDON
WATER DATA
Accutest, NJ
SDG: E62512

SAMPLE NUMBER:	DRMO-6MW1S-GW-07	GWTB-012100		
SAMPLE DATE:	01/21/00	01/21/00	/ /	/ /
LABORATORY ID:	E62512-2	E62512-1		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	UG/L	UG/L		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
1,1,1-TRICHLOROETHANE	1	U		1	U							
1,1,2,2-TETRACHLOROETHANE	1	U		1	U							
1,1,2-TRICHLOROETHANE	1	U		1	U							
1,1-DICHLOROETHANE	1	U		1	U							
1,1-DICHLOROETHENE	1	U		1	U							
1,2-DIBROMO-3-CHLOROPROPANE	1	U		1	U							
1,2-DIBROMOETHANE	1	U		1	U							
1,2-DICHLOROBENZENE	1	U		1	U							
1,2-DICHLOROETHANE	1	U		1	U							
1,2-DICHLOROPROPANE	1	U		1	U							
1,3-DICHLOROBENZENE	1	U		1	U							
1,4-DICHLOROBENZENE	1	U		1	U							
2-BUTANONE	5	U		5	U							
2-HEXANONE	5	U		5	U							
4-METHYL-2-PENTANONE	5	U		5	U							
ACETONE	5	U		5	U							
BENZENE	1	U		1	U							
BROMOCHLOROMETHANE	1	U		1	U							
BROMODICHLOROMETHANE	1	U		1	U							
BROMOFORM	1	U		1	U							
BROMOMETHANE	1	UJ	C	1	UJ	C						
CARBON DISULFIDE	1	U		1	U							
CARBON TETRACHLORIDE	1	U		1	U							
CHLOROBENZENE	1	U		1	U							
CHLOROETHANE	1	U		1	U							
CHLOROFORM	1	U		1	U							
CHLOROMETHANE	1	U		1	U							
CIS-1,2-DICHLOROETHENE	1	U		1	U							
CIS-1,3-DICHLOROPROPENE	1	U		1	U							
DIBROMOCHLOROMETHANE	1	U		1	U							
ETHYLBENZENE	1	U		1	U							
METHYLENE CHLORIDE	2	U		2	U							
STYRENE	1	U		1	U							
TETRACHLOROETHENE	1	U		1	U							

CTO267 -NSB NEW LONDON

WATER DATA

Accutest, NJ

SDG: E62512

SAMPLE NUMBER:	DRMO-6MW1S-GW-07	GWTB-012100	/ /	/ /
SAMPLE DATE:	01/21/00	01/21/00		
LABORATORY ID:	E62512-2	E62512-1		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	UG/L	UG/L		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
TOLUENE	1	U		1	U							
TRANS-1,2-DICHLOROETHENE	1	U		1	U							
TRANS-1,3-DICHLOROPROPENE	1	U		1	U							
TRICHLOROETHENE	1	U		1	U							
VINYL CHLORIDE	1	U		1	U							
XYLENES, TOTAL	1	U		1	U							

CTO267 - NSB NEW LONDON
WATER DATA
Accutest, NJ
SDG: E62512

SAMPLE NUMBER:	DRMO-6MW1S-GW-07			/ /			/ /			/ /		
SAMPLE DATE:	01/21/00											
LABORATORY ID:	E62512-2											
QC_TYPE:	NORMAL											
% SOLIDS:	0.0 %			100.0 %			100.0 %			100.0 %		
UNITS:	UG/L											
FIELD DUPLICATE OF:												

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
4,4'-DDD	0.02	U										
4,4'-DDE	0.02	U										
4,4'-DDT	0.02	U										
ALDRIN	0.01	U										
ALPHA-BHC	0.01	U										
ALPHA-CHLORDANE	0.01	U										
AROCLOR-1016	0.2	U										
AROCLOR-1221	0.4	U										
AROCLOR-1232	0.2	U										
AROCLOR-1242	0.2	U										
AROCLOR-1248	0.2	U										
AROCLOR-1254	0.2	U										
AROCLOR-1260	0.2	U										
BETA-BHC	0.01	U										
DELTA-BHC	0.01	U										
DIELDRIN	0.02	U										
ENDOSULFAN I	0.01	U										
ENDOSULFAN II	0.02	U										
ENDOSULFAN SULFATE	0.02	U										
ENDRIN	0.02	U										
ENDRIN ALDEHYDE	0.02	U										
ENDRIN KETONE	0.02	U										
GAMMA-BHC (LINDANE)	0.01	U										
GAMMA-CHLORDANE	0.01	U										
HEPTACHLOR	0.01	U										
HEPTACHLOR EPOXIDE	0.01	U										
METHOXYCHLOR	0.1	U										
TOXAPHENE	1	U										

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO: **M. MENGEL** **DATE:** **APRIL 6, 2000**

FROM: **GRETCHEN PHIPPS** **COPIES:** **DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION – SEMIVOLATILES AND PAHs**
CTO 267 - NSB NEW LONDON
SDG – E62315A

SAMPLES: 10/Aqueous/

DRMO-GWMW10D-GW-07	DRMO-GWMW10S-GW-07
DRMO-GWMW11D-GW-07	DRMO-GWMW11S-GW-07
DRMO-GWMW2D-GW-07	DRMO-GWMW2S-GW-07
DRMO-GWMW6D-GW-07	DRMO-GWMW6S-GW-07
DRMO-GWMW9S-GW-07	GWFD-011900

Overview

The sample set for CTO 267, NSB New London, SDG E62315A, consists of ten (10) aqueous environmental samples. One (1) field duplicate pair (DRMO-GWMW9S-GW-07 / GWFD-011900) was included within this SDG.

All samples were analyzed for target compound list (TAL) semivolatile organics and polynuclear aromatic hydrocarbons (PAHs). The samples were collected by Tetra Tech NUS on January 18-20, 2000 and analyzed by Accutest Laboratories under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. Semivolatile analyses were conducted using SW 846 method 8270C. PAH analyses were conducted using SW 846 method 8310.

The data was evaluated based on the following parameters:

*	Data Completeness
*	Holding Times
*	GC/MS Tuning and System Performance
	Initial/Continuing Calibrations
*	Laboratory Method Blanks
*	Surrogate Spike Recoveries
	Matrix Spike/Matrix Spike Duplicate Results
	Blank Spike Results
*	Internal Standard Performance
*	Field Duplicate Results
*	Compound Identification
*	Compound Quanitation
*	Detection Limits

* - All quality control criteria were met for this parameter.

Initial/Continuing Calibrations

The initial calibration on January 4, 2000 contained a %RSD for hexachlorocyclopentadiene that was >30% quality control limit affecting the samples analyzed on instrument GCMSR. The nondetected results reported for hexachlorocyclopentadiene in the affected samples were qualified as estimated, "UJ".

The continuing calibration on January 24, 2000 contained a %D for hexachlorocyclopentadiene that was >25% quality control limit affecting the samples analyzed on instrument GCMSR on 1-24-00. The nondetected results reported for hexachlorocyclopentadiene in the affected samples were qualified as estimated, "UJ".

Matrix Spike/Matrix Spike Duplicate Results

The Matrix Spike/Matrix Spike Duplicate percent recoveries (%Rs) for 4,6-dinitro-2-methylphenol and 3-nitroaniline were less than the lower quality control limits affecting sample GWFD-011900. The relative percent differences (%RPDs) for 2,4-dinitrophenol, 4,6-dinitro-2-methylphenol, 4-chloroaniline and 3-nitroaniline were greater than the upper quality control limits affecting sample GWFD-011900. The nondetected results reported for 2,4-dinitrophenol, 4,6-dinitro-2-methylphenol, 4-chloroaniline and 3-nitroaniline in the affected sample were qualified as estimated, "UJ".

The Matrix Spike/Matrix Spike Duplicate percent recoveries (%Rs) for phenol and 3-nitroaniline were less than the lower quality control limits affecting sample DRMO-GMW10D-GW-07. The relative percent differences (%RPDs) for 4-chloroanilne and 3-nitroaniline were greater than the upper quality control limits affecting sample DRMO-GMW10D-GW-07. The nondetected results reported for phenol, 4-chloroanilne and 3-nitroaniline in the affected sample were qualified as estimated, "UJ".

Blank Spike Results

The Blank Spike %Rs for benzoic acid and phenol were less than the lower quality control limits affecting samples DRMO-GMW11D-GW-07, DRMO-GMW11S-GW-07, DRMO-GMW2D-GW-07, DRMO-GMW2S-GW-07, DRMO-GMW9S-GW-07 and GWFD-011900. The nondetected results reported for benzoic acid and phenol in the affected samples were qualified as estimated, "UJ".

The Blank Spike %Rs for benzoic acid, 3-nitroaniline and phenol were less than the lower quality control limits affecting samples DRMO-GMW10D-GW-07, DRMO-GMW10S-GW-07, DRMO-GMW6D-GW-07 and DRMO-GMW6S-GW-07. The nondetected results reported for benzoic acid, 3-nitroaniline and phenol in the affected samples were qualified as estimated, "UJ".

Notes

The PAH compounds are listed on the semivolatile form 1s. However, they were reported using SW 846 method 8310.

Executive Summary

Laboratory Performance: Hexachlorocyclopentadiene was qualified due to calibration noncompliances.

Other Factors Affecting Data Quality: Several Matrix Spike/Matrix Spike Duplicate and Blank Spike noncompliances were noted.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Review Data Review", February 1994, "EPA Region I Volatile/Semivolatile Data Validation Functional Guidelines", December 1996 and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide." (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Gretchen A. Phipps

Tetra Tech NUS
Gretchen A. Phipps

Tetra Tech NUS
Joseph A. Samchuck
Quality Control Officer

Attachments:

1. Appendix A - Qualified Analytical Data
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Regional Worksheets
4. Appendix D - Support Documentation

APPENDIX A
QUALIFIED ANALYTICAL RESULTS

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - include ICSAB % R's
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCD% between columns for positive results
V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W = EMPC result
X = Signal to noise response drop

CTO267 - NSB NEW LONDON
WATER DATA
Accutest, NJ
SDG: E62315A

SAMPLE NUMBER:	DRMO-6MW10D-GW-07			DRMO-6MW10S-GW-07			DRMO-6MW11D-GW-07			DRMO-6MW11S-GW-07		
SAMPLE DATE:	01/18/00			01/18/00			01/19/00			01/19/00		
LABORATORY ID:	E62315-4A			E62315-5A			E62315-10A			E62315-9A		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
1,2,4-TRICHLOROBENZENE	2.1	U		2	U		2	U		2	U	
1,2-DICHLOROBENZENE	2.1	U		2	U		2	U		2	U	
1,3-DICHLOROBENZENE	2.1	U		2	U		2	U		2	U	
1,4-DICHLOROBENZENE	2.1	U		2	U		2	U		2	U	
2,4,5-TRICHLOROPHENOL	5.2	U		5	U		5	U		5	U	
2,4,6-TRICHLOROPHENOL	5.2	U		5	U		5	U		5	U	
2,4-DICHLOROPHENOL	5.2	U		5	U		5	U		5	U	
2,4-DIMETHYLPHENOL	5.2	U		5	U		5	U		5	U	
2,4-DINITROPHENOL	21	U		20	U		20	U		20	U	
2,4-DINITROTOLUENE	2.1	U		2	U		2	U		2	U	
2,6-DINITROTOLUENE	2.1	U		2	U		2	U		2	U	
2-CHLORONAPHTHALENE	5.2	U		5	U		5	U		5	U	
2-CHLOROPHENOL	5.2	U		5	U		5	U		5	U	
2-METHYLPHENOL	5.2	U		5	U		5	U		5	U	
2-NITROANILINE	5.2	U		5	U		5	U		5	U	
2-NITROPHENOL	5.2	U		5	U		5	U		5	U	
3&4-METHYLPHENOL	5.2	U		5	U		5	U		5	U	
3,3'-DICHLOROBENZIDINE	5.2	U		5	U		5	U		5	U	
3-NITROANILINE	5.2	UJ	DE	5	UJ	E	5	U		5	U	
4,6-DINITRO-2-METHYLPHENOL	21	U		20	U		20	U		20	U	
4-BROMOPHENYL PHENYL ETHER	2.1	U		2	U		2	U		2	U	
4-CHLORO-3-METHYLPHENOL	5.2	U		5	U		5	U		5	U	
4-CHLOROANILINE	5.2	UJ	D	5	U		5	U		5	U	
4-CHLOROPHENYL PHENYL ETHER	2.1	U		2	U		2	U		2	U	
4-NITROANILINE	5.2	U		5	U		5	U		5	U	
4-NITROPHENOL	21	U		20	U		20	U		20	U	
BENZOIC ACID	21	UJ	E	20	UJ	E	20	UJ	E	20	UJ	E
BIS(2-CHLOROETHOXY)METHANE	2.1	U		2	U		2	U		2	U	
BIS(2-CHLOROETHYL)ETHER	2.1	U		2	U		2	U		2	U	
BIS(2-CHLOROISOPROPYL) ETHER	2.1	U		2	U		2	U		2	U	
BIS(2-ETHYLHEXYL)PHTHALATE	2.1	U		4.1			2	U		2	U	
BUTYLBENZYL PHTHALATE	2.1	U		2	U		2	U		2	U	
CARBAZOLE	2.1	U		2	U		2	U		2	U	
DI-N-[illegible]L PH[illegible]TE							2	U		2	U	

CTO267 - NSB NEW LONDON
WATER DATA
Accutest, NJ
SDG: E62315A

SAMPLE NUMBER:	DRMO-6MW10D-GW-07			DRMO-6MW10S-GW-07			DRMO-6MW11D-GW-07			DRMO-6MW11S-GW-07		
SAMPLE DATE:	01/18/00			01/18/00			01/19/00			01/19/00		
LABORATORY ID:	E62315-4A			E62315-5A			E62315-10A			E62315-9A		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
DI-N-OCTYL PHTHALATE	2.1	U		2	U		2	U		2	U	
DIBENZOFURAN	5.2	U		5	U		5	U		5	U	
DIETHYL PHTHALATE	2.1	U		2	U		2	U		2	U	
DIMETHYL PHTHALATE	2.1	U		2	U		2	U		2	U	
HEXACHLOROBENZENE	2.1	U		2	U		2	U		2	U	
HEXACHLOROBUTADIENE	5.2	U		5	U		5	U		5	U	
HEXACHLOROCYCLOPENTADIENE	21	UJ	C	20	UJ	C	20	U		20	U	
HEXACHLOROETHANE	5.2	U		5	U		5	U		5	U	
ISOPHORONE	2.1	U		2	U		2	U		2	U	
N-NITROSO-DI-N-PROPYLAMINE	5.2	U		5	U		5	U		5	U	
N-NITROSODIPHENYLAMINE	5.2	U		5	U		5	U		5	U	
NITROBENZENE	2.1	U		2	U		2	U		2	U	
PENTACHLOROPHENOL	21	U		20	U		20	U		20	U	
PHENOL	5.2	UJ	DE	5	UJ	E	5	UJ	E	5	UJ	E

CTO267 - NSB NEW LONDON
WATER DATA
Accutest, NJ
SDG: E62315A

	DRMO-6MW2D-GW-07			DRMO-6MW2S-GW-07			DRMO-6MW6D-GW-07			DRMO-6MW6S-GW-07		
SAMPLE NUMBER:												
SAMPLE DATE:	01/20/00			01/20/00			01/18/00			01/18/00		
LABORATORY ID:	E62315-12A			E62315-11A			E62315-3A			E62315-2A		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
1,2,4-TRICHLOROBENZENE	2	U		2	U		2.1	U		2	U	
1,2-DICHLOROBENZENE	2	U		2	U		2.1	U		2	U	
1,3-DICHLOROBENZENE	2	U		2	U		2.1	U		2	U	
1,4-DICHLOROBENZENE	2	U		2	U		2.1	U		2	U	
2,4,5-TRICHLOROPHENOL	5	U		5	U		5.3	U		5.1	U	
2,4,6-TRICHLOROPHENOL	5	U		5	U		5.3	U		5.1	U	
2,4-DICHLOROPHENOL	5	U		5	U		5.3	U		5.1	U	
2,4-DIMETHYLPHENOL	5	U		5	U		5.3	U		5.1	U	
2,4-DINITROPHENOL	20	U		20	U		21	U		20	U	
2,4-DINITROTOLUENE	2	U		2	U		2.1	U		2	U	
2,6-DINITROTOLUENE	2	U		2	U		2.1	U		2	U	
2-CHLORONAPHTHALENE	5	U		5	U		5.3	U		5.1	U	
2-CHLOROPHENOL	5	U		5	U		5.3	U		5.1	U	
2-METHYLPHENOL	5	U		5	U		5.3	U		5.1	U	
2-NITROANILINE	5	U		5	U		5.3	U		5.1	U	
2-NITROPHENOL	5	U		5	U		5.3	U		5.1	U	
3&4-METHYLPHENOL	5	U		5	U		5.3	U		5.1	U	
3,3'-DICHLOROBENZIDINE	5	U		5	U		5.3	U		5.1	U	
3-NITROANILINE	5	U		5	U		5.3	UJ	E	5.1	UJ	E
4,6-DINITRO-2-METHYLPHENOL	20	U		20	U		21	U		20	U	
4-BROMOPHENYL PHENYL ETHER	2	U		2	U		2.1	U		2	U	
4-CHLORO-3-METHYLPHENOL	5	U		5	U		5.3	U		5.1	U	
4-CHLOROANILINE	5	U		5	U		5.3	U		5.1	U	
4-CHLOROPHENYL PHENYL ETHER	2	U		2	U		2.1	U		2	U	
4-NITROANILINE	5	U		5	U		5.3	U		5.1	U	
4-NITROPHENOL	20	U		20	U		21	U		20	U	
BENZOIC ACID	20	UJ	E	20	UJ	E	21	UJ	E	20	UJ	E
BIS(2-CHLOROETHOXY)METHANE	2	U		2	U		2.1	U		2	U	
BIS(2-CHLOROETHYL)ETHER	2	U		2	U		2.1	U		2	U	
BIS(2-CHLOROISOPROPYL) ETHER	2	U		2	U		2.1	U		2	U	
BIS(2-ETHYLHEXYL)PHTHALATE	2	U		2	U		2.1	U		2	U	
BUTYLBENZYL PHTHALATE	2	U		2	U		2.1	U		2	U	
CARBAZOLE	2	U		2	U		2.1	U		2	U	
DI[illegible]YL PH[illegible]ATE							2.1	U		2	U	

CTO267 - NSB NEW LONDON
WATER DATA
Accutest, NJ
SDG: E62315A

SAMPLE NUMBER:	DRMO-6MW2D-GW-07			DRMO-6MW2S-GW-07			DRMO-6MW6D-GW-07			DRMO-6MW6S-GW-07		
SAMPLE DATE:	01/20/00			01/20/00			01/18/00			01/18/00		
LABORATORY ID:	E62315-12A			E62315-11A			E62315-3A			E62315-2A		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
DI-N-OCTYL PHTHALATE	2	U		2	U		2.1	U		2	U	
DIBENZOFURAN	5	U		5	U		5.3	U		5.1	U	
DIETHYL PHTHALATE	2	U		2	U		2.1	U		2	U	
DIMETHYL PHTHALATE	2	U		2	U		2.1	U		2	U	
HEXACHLOROBENZENE	2	U		2	U		2.1	U		2	U	
HEXACHLOROBUTADIENE	5	U		5	U		5.3	U		5.1	U	
HEXACHLOROCYCLOPENTADIENE	20	U		20	U		21	UJ	C	20	UJ	C
HEXACHLOROETHANE	5	U		5	U		5.3	U		5.1	U	
ISOPHORONE	2	U		2	U		2.1	U		2	U	
N-NITROSO-DI-N-PROPYLAMINE	5	U		5	U		5.3	U		5.1	U	
N-NITROSODIPHENYLAMINE	5	U		5	U		5.3	U		5.1	U	
NITROBENZENE	2	U		2	U		2.1	U		2	U	
PENTACHLOROPHENOL	20	U		20	U		21	U		20	U	
PHENOL	5	UJ	E	5	UJ	E	5.3	UJ	E	5.1	UJ	E

CTO267 - NSB NEW LONDON
WATER DATA
Accutest, NJ
SDG: E62315A

SAMPLE NUMBER:	DRMO-6MW9S-GW-07			GWFD-011900								
SAMPLE DATE:	01/19/00			01/19/00			/ /			/ /		
LABORATORY ID:	E62315-8A			E62315-7A								
QC_TYPE:	NORMAL			NORMAL								
% SOLIDS:	0.0 %			0.0 %			100.0 %			100.0 %		
UNITS:	UG/L			UG/L								
FIELD DUPLICATE OF:				-DRMO-GMW9S-GW-07								
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
1,2,4-TRICHLOROBENZENE	2.1	U		2.1	U							
1,2-DICHLOROBENZENE	2.1	U		2.1	U							
1,3-DICHLOROBENZENE	2.1	U		2.1	U							
1,4-DICHLOROBENZENE	2.1	U		2.1	U							
2,4,5-TRICHLOROPHENOL	5.2	U		5.2	U							
2,4,6-TRICHLOROPHENOL	5.2	U		5.2	U							
2,4-DICHLOROPHENOL	5.2	U		5.2	U							
2,4-DIMETHYLPHENOL	5.2	U		5.2	U							
2,4-DINITROPHENOL	21	U		21	UJ	D						
2,4-DINITROTOLUENE	2.1	U		2.1	U							
2,6-DINITROTOLUENE	2.1	U		2.1	U							
2-CHLORONAPHTHALENE	5.2	U		5.2	U							
2-CHLOROPHENOL	5.2	U		5.2	U							
2-METHYLPHENOL	5.2	U		5.2	U							
2-NITROANILINE	5.2	U		5.2	U							
2-NITROPHENOL	5.2	U		5.2	U							
3&4-METHYLPHENOL	5.2	U		5.2	U							
3,3'-DICHLOROBENZIDINE	5.2	U		5.2	U							
3-NITROANILINE	5.2	U		5.2	UJ	D						
4,6-DINITRO-2-METHYLPHENOL	21	U		21	UJ	D						
4-BROMOPHENYL PHENYL ETHER	2.1	U		2.1	U							
4-CHLORO-3-METHYLPHENOL	5.2	U		5.2	U							
4-CHLOROANILINE	5.2	U		5.2	UJ	D						
4-CHLOROPHENYL PHENYL ETHER	2.1	U		2.1	U							
4-NITROANILINE	5.2	U		5.2	U							
4-NITROPHENOL	21	U		21	U							
BENZOIC ACID	21	UJ	E	21	UJ	E						
BIS(2-CHLOROETHOXY)METHANE	2.1	U		2.1	U							
BIS(2-CHLOROETHYL)ETHER	2.1	U		2.1	U							
BIS(2-CHLOROISOPROPYL) ETHER	2.1	U		2.1	U							
BIS(2-ETHYLHEXYL)PHTHALATE	2.1	U		2.1	U							
BUTYLBENZYL PHTHALATE	2.1	U		2.1	U							
CARBAZOLE	2.1	U		2.1	U							
DI-N ... L PHT... ...TE												

CTO267 - NSB NEW LONDON
WATER DATA
Accutest, NJ
SDG: E62315A

SAMPLE NUMBER:	DRMO-6MW9S-GW-07	GWFD-011900		
SAMPLE DATE:	01/19/00	01/19/00	/ /	/ /
LABORATORY ID:	E62315-8A	E62315-7A		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	UG/L	UG/L		
FIELD DUPLICATE OF:		DRMO-GMW9S-GW-07		

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
DI-N-OCTYL PHTHALATE	2.1	U		2.1	U							
DIBENZOFURAN	5.2	U		5.2	U							
DIETHYL PHTHALATE	2.1	U		2.1	U							
DIMETHYL PHTHALATE	2.1	U		2.1	U							
HEXACHLOROBENZENE	2.1	U		2.1	U							
HEXACHLOROBUTADIENE	5.2	U		5.2	U							
HEXACHLOROCYCLOPENTADIENE	21	U		21	U							
HEXACHLOROETHANE	5.2	U		5.2	U							
ISOPHORONE	2.1	U		2.1	U							
N-NITROSO-DI-N-PROPYLAMINE	5.2	U		5.2	U							
N-NITROSODIPHENYLAMINE	5.2	U		5.2	U							
NITROBENZENE	2.1	U		2.1	U							
PENTACHLOROPHENOL	21	U		21	U							
PHENOL	5.2	UJ	E	5.2	UJ	E						

CTO267 - NSB NEW LONDON
WATER DATA
Accutest, NJ
SDG: E62315A

SAMPLE NUMBER:	DRMO-6MW10D-GW-07			DRMO-6MW10S-GW-07			DRMO-6MW11D-GW-07			DRMO-6MW11S-GW-07		
SAMPLE DATE:	01/18/00			01/18/00			01/19/00			01/19/00		
LABORATORY ID:	E62315-4A			E62315-5A			E62315-10A			E62315-9A		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	1.1	U		1	U		1	U		1.1	U	
2-METHYLNAPHTHALENE	1.1	U		1	U		1	U		1.1	U	
ACENAPHTHENE	1.1	U		1	U		1	U		1.1	U	
ACENAPHTHYLENE	1.1	U		1	U		1	U		1.1	U	
ANTHRACENE	1.1	U		1	U		1	U		1.1	U	
BENZO(A)ANTHRACENE	0.16	U		0.15	U		0.15	U		0.16	U	
BENZO(A)PYRENE	0.16	U		0.15	U		0.15	U		0.16	U	
BENZO(B)FLUORANTHENE	0.16	U		0.15	U		0.15	U		0.16	U	
BENZO(G,H,I)PERYLENE	0.16	U		0.15	U		0.15	U		0.16	U	
BENZO(K)FLUORANTHENE	0.16	U		0.15	U		0.15	U		0.16	U	
CHRYSENE	0.16	U		0.15	U		0.15	U		0.16	U	
DIBENZO(A,H)ANTHRACENE	0.16	U		0.15	U		0.15	U		0.16	U	
FLUORANTHENE	1.1	U		1	U		1	U		1.1	U	
FLUORENE	1.1	U		1	U		1	U		1.1	U	
INDENO(1,2,3-CD)PYRENE	0.16	U		0.15	U		0.15	U		0.16	U	
NAPHTHALENE	1.1	U		1	U		1	U		1.1	U	
PHENANTHRENE	1.1	U		1	U		1	U		1.1	U	
PYRENE	1.1	U		1	U		1	U		1.1	U	

CTO267 - NSB NEW LONDON
WATER DATA
Accutest, NJ
SDG: E62315A

SAMPLE NUMBER:	DRMO-6MW2D-GW-07			DRMO-6MW2S-GW-07			DRMO-6MW6D-GW-07			DRMO-6MW6S-GW-07		
SAMPLE DATE:	01/20/00			01/20/00			01/18/00			01/18/00		
LABORATORY ID:	E62315-12A			E62315-11A			E62315-3A			E62315-2A		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	1	U		1	U		1	U		1	U	
2-METHYLNAPHTHALENE	1	U		1	U		1	U		1	U	
ACENAPHTHENE	1	U		1	U		1	U		1	U	
ACENAPHTHYLENE	1	U		1	U		1	U		1	U	
ANTHRACENE	1	U		1	U		1	U		1	U	
BENZO(A)ANTHRACENE	0.15	U		0.15	U		0.16	U		0.15	U	
BENZO(A)PYRENE	0.15	U		0.15	U		0.16	U		0.15	U	
BENZO(B)FLUORANTHENE	0.15	U		0.15	U		0.16	U		0.15	U	
BENZO(G,H,I)PERYLENE	0.15	U		0.15	U		0.16	U		0.15	U	
BENZO(K)FLUORANTHENE	0.15	U		0.15	U		0.16	U		0.15	U	
CHRYSENE	0.15	U		0.15	U		0.16	U		0.15	U	
DIBENZO(A,H)ANTHRACENE	0.15	U		0.15	U		0.16	U		0.15	U	
FLUORANTHENE	1	U		1	U		1	U		1	U	
FLUORENE	1	U		1	U		1	U		1	U	
INDENO(1,2,3-CD)PYRENE	0.15	U		0.15	U		0.16	U		0.15	U	
NAPHTHALENE	1	U		1	U		1	U		1	U	
PHENANTHRENE	1	U		1	U		1	U		1	U	
PYRENE	1	U		1	U		1	U		1	U	

CTO267 - NSB NEW LONDON
WATER DATA
Accutest, NJ
SDG: E62315A

SAMPLE NUMBER:	DRMO-6MW9S-GW-07			GWFD-011900			/ /			/ /		
SAMPLE DATE:	01/19/00			01/19/00								
LABORATORY ID:	E62315-8A			E62315-7A								
QC_TYPE:	NORMAL			NORMAL								
% SOLIDS:	0.0 %			0.0 %			100.0 %			100.0 %		
UNITS:	UG/L			UG/L								
FIELD DUPLICATE OF:				DRMO-GMW9S-GW-07								
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	1.1	U		1.1	U							
2-METHYLNAPHTHALENE	1.1	U		1.1	U							
ACENAPHTHENE	1.1	U		1.1	U							
ACENAPHTHYLENE	1.1	U		1.1	U							
ANTHRACENE	1.1	U		1.1	U							
BENZO(A)ANTHRACENE	0.16	U		0.16	U							
BENZO(A)PYRENE	0.16	U		0.16	U							
BENZO(B)FLUORANTHENE	0.16	U		0.16	U							
BENZO(G,H,I)PERYLENE	0.16	U		0.16	U							
BENZO(K)FLUORANTHENE	0.16	U		0.16	U							
CHRYSENE	0.16	U		0.16	U							
DIBENZO(A,H)ANTHRACENE	0.16	U		0.16	U							
FLUORANTHENE	1.1	U		1.1	U							
FLUORENE	1.1	U		1.1	U							
INDENO(1,2,3-CD)PYRENE	0.16	U		0.16	U							
NAPHTHALENE	1.1	U		1.1	U							
PHENANTHRENE	1.1	U		1.1	U							
PYRENE	1.1	U		1.1	U							

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO: **MARK MENGEL** **DATE: APRIL 7, 2000**

FROM: **LINDA KARSONOVICH** **COPIES: DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION: SVOA/PAH**
CTO 267, NEW LONDON
SDG E62512A

SAMPLES: 1/Aqueous/

DRMO-6MW1S-GW-07

Overview

The sample set for the CTO 267, New London, SDG E62512A consists of one (1) aqueous environmental sample. The sample was analyzed for selected semivolatile organic compounds and polynuclear aromatic hydrocarbons (PAH). No field duplicate pairs were included in the SDG.

The sample was collected by TetraTech NUS on January 21, 2000 and were analyzed by Accutest. Analyses were conducted using SW-846 Methods 8270C and 8310 analytical and reporting protocols.

The data were evaluated based on the following parameters:

- Data Completeness
- Holding Times
- GC/MS Tuning
- Calibration
- Blanks
- Surrogate Spike Recoveries
- Matrix Spike/Matrix Spike Duplicate Results
- Blank Spike Results
- Field Duplicate Precision
- Internal Standards Performance
- Instrument Performance
- Compound Identification
- Compound Quantitation
- Detection Limits

The asterisk (*) indicates that all quality control criteria were met for this parameter. Qualified (if applicable) analytical results are summarized in Appendix A. Results as reported by the laboratory are presented in Appendix B. Appendix C contains Region I worksheets, and Appendix D contains the documentation to support the findings as discussed in this data validation report. The attached Table I summarizes the validation qualifications which were based on the following information:

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Several compounds fell below the lower quality control limits in the semivolatile MS/MSD. The compounds were not detected in the unspiked sample. The unspiked sample was not included in this SDG. No qualifiers were assigned on this basis.

BLANK SPIKE RESULTS

Several compounds fell below the lower quality control limits in the semivolatile blank spikes. The compounds were not detected in the unspiked samples. Nondetected results for 4,6-dinitro-2-methylphenol, pentachlorophenol, 3,3'-dichlorobenzidine, and 3-nitroaniline were qualified as estimated, UJ.

ADDITIONAL COMMENTS

Positive results reported at concentrations below the CRQL were qualified as estimated, (J).

The quantitation report for the semivolatile fraction of the sample was not in the SDG. The laboratory was contacted and was able to supply the missing information.

The text of this report has been formulated to address only those problem areas affecting data quality.

OVERALL ASSESSMENT

Laboratory Performance: All data quality parameters were met for this fraction. No qualifiers were assigned.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the Region I EPA "Volatile and Semivolatile Data Validation Functional Guidelines - Part II" (12/96).

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

TetraTech NUS

Linda Karsonovich
Chemist/Data Validator

TetraTech NUS

Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C - Regional Worksheets
4. Appendix D - Support Documentation

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - include ICSAB % R's
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCB D% between columns for positive results
V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = % Solid content is less than 30%

APPENDIX A

QUALIFIED LABORATORY RESULTS

CTO267 - NSB NEW LONDON
WATER DATA
Accutest, NJ
SDG: E62512A

SAMPLE NUMBER:	DRMO-6MW1S-GW-07		
SAMPLE DATE:	01/21/00	/ /	/ /	/ /
LABORATORY ID:	E62512-2A		
QC_TYPE:	NORMAL		
% SOLIDS:	0.0 %	100.0 %	100.0 %	100.0 %
UNITS:	UG/L		
FIELD DUPLICATE OF:			

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
1,2,4-TRICHLOROBENZENE	2	U										
1,2-DICHLOROBENZENE	2	U										
1,3-DICHLOROBENZENE	2	U										
1,4-DICHLOROBENZENE	2	U										
2,4,5-TRICHLOROPHENOL	5	U										
2,4,6-TRICHLOROPHENOL	5	U										
2,4-DICHLOROPHENOL	5	U										
2,4-DIMETHYLPHENOL	5	U										
2,4-DINITROPHENOL	20	U										
2,4-DINITROTOLUENE	2	U										
2,6-DINITROTOLUENE	2	U										
2-CHLORONAPHTHALENE	5	U										
2-CHLOROPHENOL	5	U										
2-METHYLPHENOL	5	U										
2-NITROANILINE	5	U										
2-NITROPHENOL	5	U										
3&4-METHYLPHENOL	5	U										
3,3'-DICHLOROBENZIDINE	5	UJ	E									
3-NITROANILINE	5	UJ	E									
4,6-DINITRO-2-METHYLPHENOL	20	UJ	E									
4-BROMOPHENYL PHENYL ETHER	2	U										
4-CHLORO-3-METHYLPHENOL	5	U										
4-CHLOROANILINE	5	U										
4-CHLOROPHENYL PHENYL ETHER	2	U										
4-NITROANILINE	5	U										
4-NITROPHENOL	20	U										
BENZOIC ACID	20	U										
BIS(2-CHLOROETHOXY)METHANE	2	U										
BIS(2-CHLOROETHYL)ETHER	2	U										
BIS(2-CHLOROISOPROPYL) ETHER	2	U										
BIS(2-ETHYLHEXYL)PHTHALATE	2											
BUTYLBENZYL PHTHALATE	2	U										
CARBAZOLE	2	U										
DI-N-BUTYL PHTHALATE												

CTO267 - NSB NEW LONDON
WATER DATA
Accutest, NJ
SDG: E62512A

SAMPLE NUMBER:	DRMO-6MW1S-GW-07			/ /			/ /			/ /		
SAMPLE DATE:	01/21/00											
LABORATORY ID:	E62512-2A											
QC_TYPE:	NORMAL											
% SOLIDS:	0.0 %			100.0 %			100.0 %			100.0 %		
UNITS:	UG/L											
FIELD DUPLICATE OF:												
	RESULT	**QUAL**	**CODE**	**RESULT**	**QUAL**	**CODE**	**RESULT**	**QUAL**	**CODE**	**RESULT**	**QUAL**	**CODE**
SEMIVOLATILES												
DI-N-OCTYL PHTHALATE	2	U										
DIBENZOFURAN	5	U										
DIETHYL PHTHALATE	2	U										
DIMETHYL PHTHALATE	2	U										
HEXACHLOROBENZENE	2	U										
HEXACHLOROBUTADIENE	5	U										
HEXACHLOROCYCLOPENTADIENE	20	U										
HEXACHLOROETHANE	5	U										
ISOPHORONE	2	U										
N-NITROSO-DI-N-PROPYLAMINE	5	U										
N-NITROSODIPHENYLAMINE	5	U										
NITROBENZENE	2	U										
PENTACHLOROPHENOL	20	UJ	E									
PHENOL	5	U										

CTO267 - NSB NEW LONDON
WATER DATA
Accutest, NJ
SDG: E62512A

SAMPLE NUMBER:	DRMO-6MW1S-GW-07			
SAMPLE DATE:	01/21/00	/ /	/ /	/ /
LABORATORY ID:	E62512-2A			
QC_TYPE:	NORMAL			
% SOLIDS:	0.0 %	100.0 %	100.0 %	100.0 %
UNITS:	UG/L			
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	1.1	U										
2-METHYLNAPHTHALENE	1.1	U										
ACENAPHTHENE	1.1	U										
ACENAPHTHYLENE	1.1	U										
ANTHRACENE	1.1	U										
BENZO(A)ANTHRACENE	0.17	U										
BENZO(A)PYRENE	0.17	U										
BENZO(B)FLUORANTHENE	0.17	U										
BENZO(G,H,I)PERYLENE	0.17	U										
BENZO(K)FLUORANTHENE	0.17	U										
CHRYSENE	0.17	U										
DIBENZO(A,H)ANTHRACENE	0.17	U										
FLUORANTHENE	1.1	U										
FLUORENE	1.1	U										
INDENO(1,2,3-CD)PYRENE	0.17	U										
NAPHTHALENE	1.1	U										
PHENANTHRENE	1.1	U										
PYRENE	1.1	U										

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**M. MENGEL**	**DATE:**	**MARCH 28, 2000**
FROM:	**TERRI L. SOLOMON**	**COPIES:**	**DV FILE**
SUBJECT:	**INORGANIC DATA VALIDATION - METALS** **CTO 267 - NSB NEW LONDON, CONNECTICUT** **SDG – E62315**		
SAMPLES:	10/Aqueous/		

DRMO-6MW10D-GW-07	DRMO-6MW10S-GW-07	DRMO-6MW11D-GW-07
DRMO-6MW11S-GW-07	DRMO-6MW2D-GW-07	DRMO-6MW2S-GW-07
DRMO-6MW6D-GW-07	DRMO-6MW6S-GW-07	DRMO-6MW9S-GW-07
GWFD-011900		

Overview

The sample set for CTO 267, NSB New London, SDG E62315, consists of ten (10) aqueous environmental samples. One (1) field duplicate pair (DRMO-6MW9S-GW-07 / GWFD-011900) was included within this SDG.

All samples were analyzed for Analyte List (TAL) metals. The samples were collected by Tetra Tech NUS on January 18, 19 and 20, 2000 and analyzed by Accutest laboratories under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. The TAL metals analyses were conducted using "USEPA Contract Laboratory Program Statement of Work for Inorganics Analysis", document ILM04.0. All analyses, with the exception of mercury, were conducted using Inductively Coupled Plasma (ICP) methodologies. Mercury analyses were conducted using Cold Vapor Atomic Absorption (CVAA). These data were evaluated based on the following parameters:

* • Data Completeness
* • Holding Times
• Calibration Verifications
• Laboratory Blank Analyses
• Interference Check Sample Analyses
• Matrix Spike Results
* • Laboratory Duplicate Results
* • Field Duplicate Results
• Serial Dilution Analyses
* • Detection Limits
* • Sample Quantitation

* - All quality control criteria were met for this parameter.

Calibration Verifications

The Contract Required Detection Limit (CRDL) Percent Recoveries (%Rs) for arsenic and zinc were > 120% quality control limit. Positive results < 3X CRDL reported for the aforementioned analytes were qualified as estimated, "J".

The CRDL %R for silver was < 80% quality control limit. The nondetected results reported for the aforementioned analyte were qualified as estimated, "UJ".

Laboratory Blank Analyses

The following contaminants were detected in the laboratory method blanks at the following maximum concentrations:

Analyte	Maximum Concentration	Aqueous Action Level
aluminum	95.6 ug/L	478 ug/L
antimony	2.5 ug/L	12.5 ug/L
beryllium	0.8 ug/L	4.0 ug/L
cadmium	1.0 ug/L	5.0 ug/L
calcium	102.4 ug/L	512 ug/L
chromium	4.3 ug/L	21.5 ug/L
cobalt	1.1 ug/L	5.5 ug/L
copper	1.3 ug/L	6.5 ug/L
iron	56.9 ug/L	284.5 ug/L
lead	1.9 ug/L	9.5 ug/L
magnesium	75.8 ug/L	379 ug/L
manganese	1.3 ug/L	6.5 ug/L
nickel	3.5 ug/L	17.5 ug/L
selenium	6.2 ug/L	31.0 ug/L
sodium	697.2 ug/L	3486 ug/L
thallium	4.4 ug/L	22.0 ug/L
vanadium	1.8 ug/L	9.0 ug/L

Affects samples: All

An action level of 5X the maximum concentration has been used to evaluate the sample data for blank contamination. Dilution factors and sample aliquots were taken into consideration when evaluating for blank contamination. Positive results less than the action level for aluminum, antimony, beryllium, cadmium, chromium, cobalt, copper, iron, lead, manganese, nickel, sodium, thallium and vanadium have been qualified as nondetected, "U". Action was not taken for the remaining analytes as the results were either greater than the action level or were nondetected results.

Interference Check Sample Analyses

The interfering analyte magnesium was present in sample DRMO-6MW10D-GW-07 at a concentration which was comparable to the level of magnesium in the Interference Check Sample (ICS) solution. Several analytes namely arsenic, cadmium, manganese and potassium were present in the ICS solution at concentrations which exceeded 2X the Instrument Detection Limit (IDL). Interference affects exist for arsenic in the affected sample. The positive result reported for arsenic was qualified as estimated, "J".

The interfering analytes calcium and magnesium were present in sample DRMO-6MW11D-GW-07 at concentrations which were comparable to the levels of calcium and magnesium in the Interference Check Sample (ICS) solution. Several analytes namely arsenic, cadmium, manganese and potassium were present in the ICS solution at concentrations which exceeded 2X the Instrument Detection Limit (IDL). Interference affects exist for arsenic and cadmium in the affected sample. The nondetected results reported for arsenic and cadmium were qualified as estimated, "UJ".

The interfering analytes calcium and magnesium were present in sample DRMO-6MW2D-GW-07 at concentrations which were comparable to the levels of calcium and magnesium in the Interference Check Sample (ICS) solution. Several analytes namely arsenic, cadmium, manganese and potassium were present in the ICS solution at concentrations which exceeded 2X the Instrument Detection Limit (IDL). Interference affects exist for arsenic in the affected sample. The nondetected result reported for arsenic was qualified as estimated, "UJ".

The interfering analyte magnesium was present in sample DRMO-6MW2S-GW-07 at a concentration which was comparable to the level of magnesium in the Interference Check Sample (ICS) solution. Several analytes namely arsenic, cadmium, manganese and potassium were present in the ICS solution at concentrations which exceeded 2X the Instrument Detection Limit (IDL). Interference affects exist for arsenic and manganese in the affected sample. The positive result reported for manganese and the nondetected result reported for arsenic were qualified as estimated, "J" and "UJ", respectively.

Matrix Spike Results

The matrix spike percent recovery for mercury was < 75% quality control limit. The nondetected results reported for the aforementioned analyte were qualified as estimated, "UJ".

ICP Serial Dilution Results

The ICP serial dilution percent differences for iron, potassium and sodium were > 15% quality control limit. The positive results reported for the aforementioned analytes were qualified as estimated, "J".

Notes

Several CRDL percent recoveries for lead, selenium and thallium were outside the 80-120% quality control limits. However, no validation actions were warranted as all sample results were either nondetects, were > 3X CRDL or were qualified as blank contamination.

Sample results < 2X the Instrument Detection Limit (IDL) for arsenic were qualified as estimated, "J".

Executive Summary

Laboratory Performance: Several CRDL %Rs were outside the 80-120% quality control limits. Several analytes were detected in the laboratory method blanks.

Other Factors Affecting Data Quality: The interfering analytes calcium and/or magnesium were present in several samples. The MS %R for mercury was < 75% quality control limit. The ICP serial dilution percent differences for iron, potassium and sodium were > 15% quality control limit. Sample results < 2X the IDL for arsenic were qualified as estimated.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Review", February 1994, "EPA Region I Functional Guidelines for Evaluating Inorganic Analyses", February 1989 and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide " (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Tetra Tech NUS
for Terri L. Solomon
Chemist

Tetra tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Regional Worksheets
4. Appendix D - Support Documentation

APPENDIX A
Qualified Analytical Results

CTO267 - NSB NEW LONDON
WATER DATA
Accutest, NJ
SDG: E62315

SAMPLE NUMBER:	DRMO-6MW10D-GW-07			DRMO-6MW10S-GW-07			DRMO-6MW11D-GW-07			DRMO-6MW11S-GW-07		
SAMPLE DATE:	01/18/00			01/18/00			01/19/00			01/19/00		
LABORATORY ID:	E62315-4			E62315-5			E62315-10			E62315-9		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	72.5	U		72.5	U		274	U	A	261	U	A
ANTIMONY	2.1	U		4.6	U	A	4.6	U	A	2.1	U	
ARSENIC	4.2	J	CKP	2.6	U		2.6	UJ	K	2.6	U	
BARIUM	44.8			127			280			89.4		
BERYLLIUM	0.20	U		0.20	U		0.20	U		0.20	U	
CADMIUM	0.37	U	A	1.2	U	A	0.30	UJ	K	0.64	U	A
CALCIUM	171000			119000			290000			99000		
CHROMIUM	1.0	U		1.0	U		1.0	U		1.0	U	
COBALT	3.3	U	A	2.4	U	A	1.2	U	A	1.4	U	A
COPPER	1.3	U		4.9	U	A	1.9	U	A	5.0	U	A
IRON	1510	J	I	935	J	I	2080	J	I	264	U	A
LEAD	1.8	U		1.8	U		1.8	U		2.7	U	A
MAGNESIUM	384000			247000			769000			237000		
MANGANESE	782			474			1010			344		
MERCURY	0.10	UJ	D	0.10	UJ	D	0.10	UJ	D	0.10	UJ	D
NICKEL	7.9	U	A	35.1			2.4	U	A	1.9	U	
POTASSIUM	175000	J	I	111000	J	I	331000	J	I	103000	J	I
SELENIUM	3.4	U		3.4	U		3.4	U		3.4	U	
SILVER	1.1	UJ	C	1.1	UJ	C	1.1	UJ	C	1.1	UJ	C
SODIUM	2870000	J	I	1780000	J	I	5630000	J	I	1770000	J	I
THALLIUM	4.1	U		4.1	U		4.1	U		4.1	U	
VANADIUM	0.70	U		311			1.5	U	A	20.6		
ZINC	77.6			91.5			8.7	J	C	77.4		

CTO267 - NSB NEW LONDON
WATER DATA
Accutest, NJ
SDG: E62315

	DRMO-6MW2D-GW-07			DRMO-6MW2S-GW-07			DRMO-6MW6D-GW-07			DRMO-6MW6S-GW-07		
SAMPLE NUMBER:	DRMO-6MW2D-GW-07			DRMO-6MW2S-GW-07			DRMO-6MW6D-GW-07			DRMO-6MW6S-GW-07		
SAMPLE DATE:	01/20/00			01/20/00			01/18/00			01/18/00		
LABORATORY ID:	E62315-12			E62315-11			E62315-3			E62315-2		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	1370			327	U	A	130	U	A	104	U	A
ANTIMONY	2.1	U		2.1	U		2.1	U		2.1	U	
ARSENIC	2.6	UJ	K	2.6	UJ	K	2.6	U		2.6	U	
BARIUM	174			28.1			39.3			27.6		
BERYLLIUM	0.20	U		0.20	U		0.20	U		0.20	U	
CADMIUM	0.33	U	A	0.60	U	A	0.45	U	A	0.36	U	A
CALCIUM	252000			165000			69500			10100		
CHROMIUM	2.4	U	A	1.0	U		1.0	U		1.0	U	
COBALT	1.8	U	A	1.7	U	A	1.8	U	A	0.70	U	
COPPER	3.2	U	A	7.5			1.3	U		1.3	U	
IRON	4890	J	I	416	J	I	7150	J	I	75.0	U	A
LEAD	1.8	U		6.1	U	A	1.8	U		1.8	U	
MAGNESIUM	719000			516000			56600			2190		
MANGANESE	687			40.3	J	K	2670			1.8	U	A
MERCURY	0.10	UJ	D	0.10	UJ	D	0.10	UJ	D	0.10	UJ	D
NICKEL	2.9	U	A	3.2	U	A	8.1	U	A	1.9	U	A
POTASSIUM	349000	J	I	230000	J	I	23800	J	I	2570	J	I
SELENIUM	3.4	U		3.4	U		3.4	U		3.4	U	
SILVER	1.1	UJ	C	1.1	UJ	C	1.1	UJ	C	1.1	UJ	C
SODIUM	5580000	J	I	3710000	J	I	431000	J	I	32300	J	I
THALLIUM	4.5	U	A	4.1	U		4.1	U		4.1	U	
VANADIUM	4.8	U	A	5.5	U	A	0.70	U		1.3	U	A
ZINC	27.0	J	C	36.9	J	C	13.3	J	C	3.8	U	

CTO267 - NSB NEW LONDON
WATER DATA
Accutest, NJ
SDG: E62315

SAMPLE NUMBER:	DRMO-6MW9S-GW-07			GWFD-011900								
SAMPLE DATE:	01/19/00			01/19/00			/ /			/ /		
LABORATORY ID:	E62315-8			E62315-7								
QC_TYPE:	NORMAL			NORMAL								
% SOLIDS:	0.0 %			0.0 %			100.0 %			100.0 %		
UNITS:	UG/L			UG/L								
FIELD DUPLICATE OF:				DRMO-GMW9S-GW-07								
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	310	U	A	340	U	A						
ANTIMONY	2.1	U		2.1	U							
ARSENIC	2.6	U		2.6	U							
BARIUM	14.6			14.4								
BERYLLIUM	0.26	U	A	0.36	U	A						
CADMIUM	0.54	U	A	0.61	U	A						
CALCIUM	1910			1910								
CHROMIUM	1.0	U		1.0	U							
COBALT	5.2	U	A	5.4	U	A						
COPPER	3.0	U	A	2.9	U	A						
IRON	15.4	U		18.9	U	A						
LEAD	1.8	U		1.8	U							
MAGNESIUM	552			551								
MANGANESE	547			549								
MERCURY	0.10	UJ	D	0.10	UJ	D						
NICKEL	4.9	U	A	4.9	U	A						
POTASSIUM	714	J	I	701	J	I						
SELENIUM	3.4	U		3.4	U							
SILVER	1.1	UJ	C	1.1	UJ	C						
SODIUM	3460	U	A	3510	J	I						
THALLIUM	4.1	U		4.1	U							
VANADIUM	1.0	U	A	1.1	U	A						
ZINC	111			120								

Tetra Tech NUS

INTERNAL CORRESPONDENCE

TO: M. MENGEL **DATE:** APRIL 6, 2000

FROM: JENNIFER MALLE **COPIES:** DV FILE

SUBJECT: INORGANIC DATA VALIDATION-TAL METALS
CTO 267 –NSB NEW LONDON
SDG – E62512

SAMPLES: 1/Aqueous/

DRMO-6MW1S-GW-07

Overview

The sample set for CTO 267, NSB, New London, SDG E62512 consists of one (1) aqueous environmental sample.

The sample was analyzed for Target Analyte List (TAL) metals. The sample was collected by Tetra Tech NUS on January 21, 2000 and analyzed by Accutest Laboratories in accordance with Naval Facilities Engineering Service Center (NFESC) Navy Installation Restoration Laboratory Quality Assurance Guide, (February 1996). All metals were analyzed under CLP analytical method ILMO4.0.

The data was evaluated based on the following parameters:

*	• Data Completeness
*	• Holding Times
	• Calibration Verification
	• Laboratory Blank Analysis
	• ICP Interference Analysis
*	• Matrix Spike Recoveries
*	• Laboratory Duplicates
*	• Laboratory Control Sample Recoveries
*	• ICP Serial Dilution
*	• Sample Quanitation
*	• Detection Limits

* - All quality control criteria were met for this parameter.

Calibration Recoveries

Several Contract Required Detection Limit (CRDL) Percent Recoveries (%Rs) reported for zinc were greater than the 110% quality control limit. The positive result less than three times the CRDL value reported for zinc was qualified as estimated, "J".

Several Contract Required Detection Limit (CRDL) Percent Recoveries (%Rs) reported for arsenic, lead and vanadium were less than the 90% quality control limit. The nondetected results reported for arsenic, lead and vanadium were qualified as estimated, "UJ".

Several Contract Required Detection Limit (CRDL) Percent Recoveries (%Rs) reported for selenium were above and below the 90%-110% quality control limits. The nondetected result reported for selenium was qualified as estimated, "UJ".

Laboratory Blank Analyses

The following contaminants were detected in the laboratory method / preparation blanks at the following maximum concentrations:

Affected samples : All

Analyte	Maximum Concentration	Action Level (aqueous)
Aluminum	106.6 ug/L	533 ug/L
Beryllium	1.0 ug/L	5.0 ug/L
Cadmium	0.90 ug/L	4.5 ug/L
Calcium	97.4 ug/L	487 ug/L
Chromium	5.8 ug/L	29.0 ug/L
Cobalt	1.2 ug/L	6.0 ug/L
Iron [1]	53.32 ug/L	266.6 ug/L
Magnesium	82.1 ug/L	410.5 ug/L
Manganese	1.5 ug/L	7.5 ug/L
Nickel	2.7 ug/L	13.5 ug/L
Vanadium	1.2 ug/L	6.0 ug/L

[1] Maximum concentration present in an aqueous preparation blank

An action level of 5X the maximum concentration was used to evaluate the sample data for blank contamination. Sample aliquot and dilution factors were taken into consideration in evaluation for blank contamination. Positive results less than the action level for cobalt, manganese and nickel were qualified as nondetect, "U", due to laboratory blank contamination. No validation action was required for the remaining analytes as all of the results reported were either greater than the blank action level or previously qualified as nondetects by the laboratory.

ICP Interference Check Sample Results

The interfering analyte magnesium was present in sample DRMW-6MW1S-GW-07 at a concentration which was comparable to the level of magnesium in the Interference Check Sample (ICS) solution. Several analytes namely arsenic, cadmium, copper, lead, manganese, nickel, potassium, selenium, vanadium and zinc were present in the ICS solution at concentrations which exceeded the Instrument Detection Limit (IDL). Interference affects exist for arsenic, selenium, vanadium and zinc in the affected sample. The positive result reported for zinc was qualified as estimated, "J". The nondetected results reported for arsenic, selenium and vanadium were qualified as estimated, "UJ".

The result reported for zinc was less than two times the Instrument Detection Limit (IDL) and therefore should be considered as an estimated value. The positive result reported for zinc was qualified as estimated, "J".

Notes

Several Contract Required Detection Limit (CRDL) Percent Recoveries (%Rs) reported for cadmium, chromium and thallium were greater than the 110% quality control limit. However, validation action was not required since results reported were nondetected and a positive bias did not affect the sample results.

Executive Summary

Laboratory Performance: Several laboratory contaminants were present in the laboratory/preparation blanks. Several analytes were qualiifed for calibration noncompliances.

Other Factors Affecting Data Quality: The interfering analyte magnesium was present in the one sample contained in this SDG. The result for zinc was less than 2x the IDL.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Review", "EPA Region I Inorganic Data Validation Functional Guidelines", December 1996 and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide " (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Tetra Tech NUS
Jennifer Malle
Environmental Scientist

Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:
1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Region I Worksheets
4. Appendix D - Support Documentation

APPENDIX A
Qualified Analytical Results

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - include ICSAB % R's
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCB D% between columns for positive results
V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = % Solid content is less than 30%

CTO267 - NSB NEW LONDON
WATER DATA
Accutest, NJ
SDG: E62512

SAMPLE NUMBER:	DRMO-6MW1S-GW-07			/ /			/ /			/ /		
SAMPLE DATE:	01/21/00											
LABORATORY ID:	E62512-2											
QC_TYPE:	NORMAL											
% SOLIDS:	0.0 %			100.0 %			100.0 %			100.0 %		
UNITS:	UG/L											
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	72.5	U										
ANTIMONY	2.1	U										
ARSENIC	2.6	UJ	CK									
BARIUM	21.5											
BERYLLIUM	0.20	U										
CADMIUM	0.30	U										
CALCIUM	117000											
CHROMIUM	1.0	U										
COBALT	1.3	U	A									
COPPER	1.3	U										
IRON	552											
LEAD	1.8	UJ	C									
MAGNESIUM	319000											
MANGANESE	2.1	U	A									
MERCURY	0.10	U										
NICKEL	2.6	U	A									
POTASSIUM	147000											
SELENIUM	3.4	UJ	CK									
SILVER	1.1	U										
SODIUM	2460000											
THALLIUM	4.1	U										
VANADIUM	0.70	UJ	CK									
ZINC	4.5	J	CKP									